Extron® Electronics
INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual

SSP 7.1

7.1 Channel Surround Sound Processor

68-1339-01
Rev. A
06 09

Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

安全须知 • 中文

这个符号提示用户该设备用户手册中有重要的操作和维护说明。

这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

电源 • 该设备只能使用产品上标明的电源。 设备必须使用有地线的供电系统供电。 第三条线（地线）是安全设施，不能不用或跳过 。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。 设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。 不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

FCC Class B Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

NOTE *This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.*

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Chapter One

Introduction

About This Manual

About the SSP 7.1

SSP 7.1 Features

Introduction

About this Manual

This manual contains information on how to mount, install, configure and operate the Extron® SSP 7.1.

In this manual, unless otherwise specified, the terms SSP 7.1, sound processor, or surround sound processor all refer to the SSP 7.1 unit.

About the SSP 7.1

The SSP 7.1 is a 7.1 channel Surround Sound processor with four digital inputs and one analog input. A variety of selectable listening modes can be changed to match the source format.

The unit can accept 2 channel analog signals, as well as digital PCM signals, and output them through various matrix decoding mode options for use in 5.1 to 7.1 system configurations.

The SSP 7.1 can decode and process licensed, branded digital source formats from Dolby® Digital[1] and DTS®[2], in their originally encoded formats. These include:

- Dolby Digital 2/0
- Dolby Digital 2/0 Surround
- Dolby Digital 5.1
- Dolby Digital Surround EX™[1]
- DTS 2-channel
- DTS Digital Surround®[2]
- DTS 96/24™[2]
- DTS-ES®[2] Matrix 6.1
- DTS 96/24 ES Matrix 6.1
- DTS-ES Discrete 6.1

SSP 7.1 Features

Advanced Control and Configuration — The SSP 7.1 Windows® Control Program provides additional configuration options beyond those available through front panel control.

Four digital audio inputs — The unit accepts four digital inputs through two optical (TosLink®) digital inputs and two S/PDIF coaxial (RCA) digital inputs.

Dolby Digital and DTS playback — The unit is able to decode and process source format from Dolby Digital and DTS, in their originally encoded formats.

Matrix decoding — The surround sound processor can decode stereo signals to produce multi-channel output.

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[1] Manufactured under license from Dolby Laboratories. Dolby, Pro Logic, and the double-D symbol are trademarks of Dolby Laboratories.

[2] Manufactured under license under U.S. Patent #'s: 5,451,942; 5,956,674; 5,974,380; 5,978,762; 6,226,616; 6,487,535; 7,003,467; 7,212,872 & other U.S. and worldwide patents issued & pending. DTS, DTS Digital Surround, ES, and Neo:6 are registered trademarks and the DTS logos, Symbol and DTS 96/24 are trademarks of DTS, Inc.

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Downmix multichannel source formats — Downmixing produces a mixed stereo or mono channel with an additional option to redistribute the downmixed signal to all channels.

Configurable analog input — Input 5 accepts balanced/unbalanced stereo analog input and can be configured to accept one or two balanced/unbalanced mono inputs through a captive screw connector. The mono source can be left, right, or a mix summed of the two.

Adjustable gain for analog input — The input gain is adjustable from 0 to +24 dB using the front panel controls or the SSP 7.1 Setup and Control Software.

Multiple Listening Modes — Not all listening modes are compatible with certain input signals. The listening mode depends not only on the format of the source material but also on the speaker configuration of the setting. Only those listening modes that are compatible for a given input are available for that signal. The SSP 7.1 comes with factory default listening modes that have been matched to the source format to take into account source format and speaker configuration.

Listening Mode Override — The Listening Mode Override customizes the listening mode to the needs of the source format, speaker configuration, the venue, and the listener's personal preferences. Selections made through the front panel can be further refined by the SSP 7.1 Setup and Control Software.

This feature can be used to associate a specific listening mode with each input type, allowing the user to switch quickly to the listening mode that suits each input type for a given room configuration and the individual user preferences.

Test Signals — Pink noise, Dolby noise (generated by the SSP 7.1) and external test signals allow full calibration of each output channel.

Speaker Compensation Delay — The signal to each output channel can be individually delayed so that the sound from all speakers is synchronized when it reaches the listener.

Lip Sync Offset — This feature delays an audio signal so that it is resynchronized with a video signal that has been delayed by video processing.

Chapter Two

Mounting

Mounting the SSP 7.1

Mounting

Mounting the SSP 7.1

The sound processor is 1U high, a half rack wide and 6" deep, for easy mounting in a range of convenient locations.

Tabletop placement

Attach the four included rubber feet to the bottom of the unit and place it in any convenient location.

Rack mounting

UL guidelines for rack mounting

The following Underwriters Laboratories (UL) guidelines are relevant to the safe installation of the transmitter in a rack:

1. **Elevated operating ambient temperature —** If the unit is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature (Tma: +122 ° F, +50 ° C) specified by Extron.
2. **Reduced air flow** — Install the equipment in the rack so that the equipment gets adequate air flow for safe operation.
3. **Mechanical loading —** Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.
4. **Circuit overloading —** Connect the equipment to the supply circuit and consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Give appropriate consideration to the equipment nameplate ratings when addressing this concern.
5. **Reliable earthing (grounding) —** Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

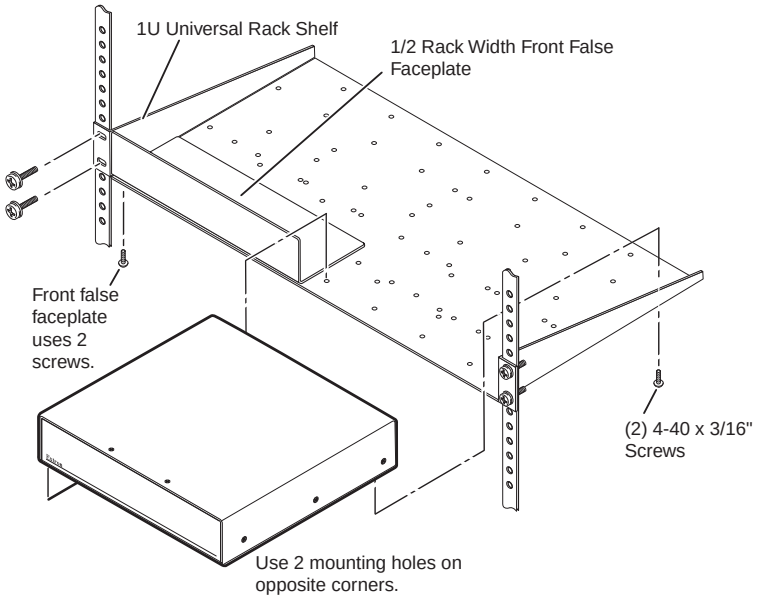
Rack mounting procedure

The unit can be mounted in the front or rear of:

- RSU 126 (6"deep, 1U rack shelf kit: part # **60-190-10**)
- RSB 126 (6" deep, 1U basic rack shelf: part # **60-604-10**)
- RSU 129 (9.5" deep, 1U rack shelf kit: part # **60-190-01**)
- RSB 129 (9.5" deep, 1U basic rack shelf: part # **60-604-01**)

To mount the unit, follow these instructions:

1. Remove rubber feet if these have been installed on the bottom of the unit.
2. Align the unit on the shelf and secure it to the shelf with two 4-40 x 3/16" screws in diagonally opposite corners (see the figure below).
3. Install false faceplate(s) or other unit(s) to the rack shelf.
4. Attach the shelf to the rack with the four provided 10-32 x 3/4" bolts.

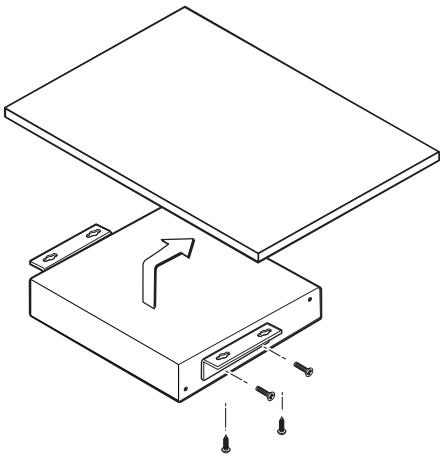

1U Universal Rack Shelf
1/2 Rack Width Front False Faceplate
Front false faceplate uses 2 screws.
(2) 4-40 x 3/16" Screws
Use 2 mounting holes on opposite corners.

Installing the SSP 7.1 on shelf rack

Under-desk mounting

To mount the SSP 7.1 under a desk or podium, using the optional Extron MBU 125 under desk mounting kit (part # **70-077-01**), follow these instructions:

1. Remove rubber feet if these have been installed on the bottom of the unit.
2. Secure the mounting brackets to the unit, using the four 4-40 screws provided (see the figure below).



Under-desk mounting the SSP 7.1

3. Hold the unit with the brackets attached against the underside of the table or other furniture. Mark the location of the screw holes of the bracket on the mounting surface.
4. Drill four pilot holes, each 3/32" (2.4 mm) in diameter by 1/4" (6.3 mm) deep in the mounting surface at the marked screw locations.
5. Insert #8 wood screws into the four pilot holes. Tighten each screw into the mounting surface until just less than 1/4" (6.3 mm) of the screw head protrudes.
6. Guide the mounting screws through the slots in the brackets and place the unit tight against the surface.
7. Slide the unit slightly in or out so that it is held in place by the screws; tighten all four screws to secure the unit in place (see the figure above).

SSP 7.1

Chapter Three

Features

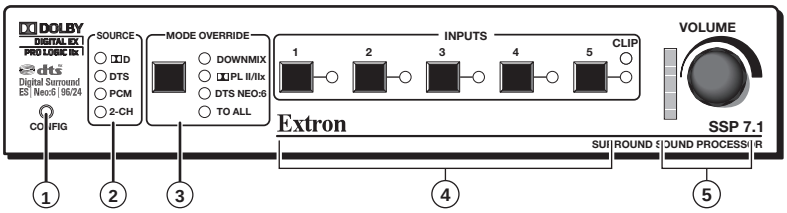
Front Panel Features

Rear Panel Features

Front Panel Operations

Features

Front Panel Features



1 **Config Port —** The SSP 7.1 can be configured using Extron Simple Instruction Set (SIS™) commands through this 2.5 mm Tip Ring Sleeve (TRS) mini jack plug (or through the 3-pole captive screw connector on the rear panel). For more information about SIS commands, see chapter 6.

2 **Input Source Format Indicator —** Four LEDs identify the source signal format as:

- Dolby Digital (D)
- DTS
- PCM
- 2-Channel (2-CH)

For more information about source formats, see "Front Panel Operations" on page 3-6 and "Source Formats" on page B-2.

3 **Mode Override Selector —** The SSP 7.1 comes with factory default listening modes associated with particular source formats. However, these default modes can be overridden by the user through the mode override button. The user defined override that is currently selected is shown by this group of LEDs. When no mode override is chosen, none of the LEDs light.

The available mode overrides are:

- Downmix
- Dolby Pro Logic II/IIx (PL II/IIx)
- DTS Neo:6 (DTS NEO:6)
- To All

Selecting an appropriate listening mode depends on the source format and on the speaker configuration. For more information about setting the Mode Override, see "Front Panel Operations" on page 3-6 and "Listening Mode Options and Usage" on page B-6.

When used in conjunction with the Input buttons, the Mode Override button is used to mute all outputs (see page 3-8).

The Mode Override is used to perform a complete system reset (see "Complete System Reset" on page 3-9).

4 **Input Selections —** Push one of the buttons to select between 5 possible audio inputs. The LED next to the currently active input lights. For more information about input selection, see page 3-8.

In conjunction with the Mode Override button, the Input buttons are used to mute all outputs (see page 3-8).

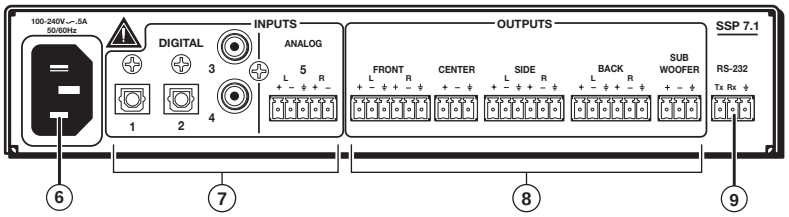
The Input buttons are also used to enable or disable the Front Panel Security Lockout (Executive Mode). For more information, see page 3-10.

In conjunction with the Volume Adjust Knob, the analog input (Input #5) is used to set analog input gain level for the analog source (see page 3-10).

⑤ **Volume Adjust Knob and LED Bar /Analog Input Gain Level Control and LED Bar —** The rotary encoder adjusts the output volume (see page 3-9).

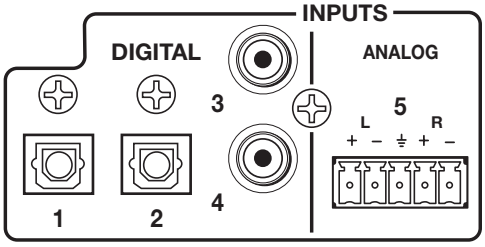
Together with the analog input button (Input #5), the knob also adjusts the analog input gain level for the analog source (see page 3-10).

Rear Panel Features



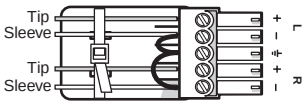
⑥ **AC Power Input —** Use an IEC power cable to connect the processor to a 100 - 240 VAC, 50 - 60 Hz, power source.

⑦ **Audio Inputs —** The SSP 7.1 accepts four digital inputs and one analog input:

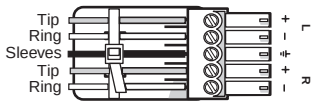


- Inputs 1 and 2 accept digital signals through S/PDIF optical cables.
- Inputs 3 and 4 accept digital signals through S/PDIF coaxial cables.
- Input 5 accepts a balanced or unbalanced, stereo or mono, analog input through a 5-pin captive screw connector.

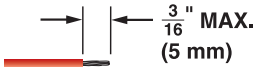
The following diagram shows the correct wiring for different input signals:



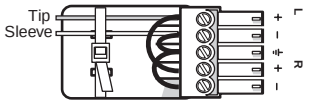
Unbalanced Stereo Input



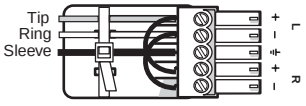
Balanced Stereo Input



Do not tin the wires!



Unbalanced Mono Input



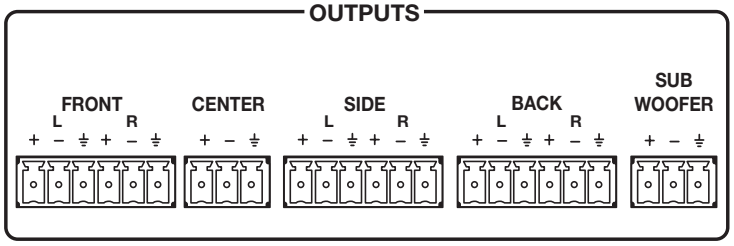
Balanced Mono Input
(high impedance)

NOTE *The length of the exposed wires in the stripping process is critical. The ideal length is 3/16" (5 mm). Any longer and the exposed wires may touch, causing a short circuit between them. Any shorter and the wires can be easily pulled out even if tightly fastened by the captive screws.*

Do not tin the wires. Tinned wire does not hold its shape and can become loose over time.

For more information about input formats, see the "Front Panel Operations" section, later in this chapter and the "Source Formats" section of Appendix B.

⑧ **Audio Outputs —** Outputs are balanced/unbalanced line level analog signals that feed into multi-channel amplifiers for configurations up to 7.1 surround sound. For more information about speaker configuration, see pages 4-2 and 4-3.



Individual output settings are configured through the SSP 7.1 Setup and Control Software (see page 5-7) or SIS commands (see page 6-9):

Mono — output is through the center channel only but can be reconfigured to be output through the left and right front channels. In the absence of a center channel, mono is also output through the left and right front channels.

2-Channel (Stereo) — only the front left and front right channels are used.

2.0 to 2.1 Surround Configurations — Audio is output through front left and front right channels with (2.1) or without (2.0) a subwoofer.

3.0 to 3.1 Surround Configurations — Audio is output through front left, front right, and center channels with (3.1) or without (3.0) a subwoofer.

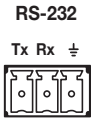
4.0 to 5.1 Surround Configurations — Audio is output through a combination of front left and right, side left and right, center and subwoofer channels.

6.0 to 6.1 Surround Configurations — Adds a back channel to 5.0 or 5.1 configurations. The back left channel receives the sixth channel information and serves as the center back speaker in this configuration.

7.0 to 7.1 Surround Configurations — both the back left and right channels are active. Listening modes designed for 6.1 channel outputs pass the same signal to both the back left and right channels. Listening modes designed for 7.1 channel outputs pass separate signals to each channel to produce a stereo back sound effect.

For more information about speaker configuration and output formats, see the "Listening Mode Options and Usage" section of Appendix B.

⑨ **RS-232 Port —** The SSP 7.1 can be configured using the SSP 7.1 Setup and Control Software or SIS commands, using this 3-pole captive screw connector (or the 2.5 mm Tip Ring Sleeve (TRS) mini jack plug on the front panel).

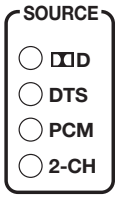


For more information about the SSP 7.1 Setup and Control Software, see chapter 5. For more information about SIS commands, see chapter 6.

Front Panel Operations

Source format

The bank of four LEDs lights to identify the format of the audio input:



- Dolby Digital (DD): Dolby Digital 2/0, Dolby Digital 2/0 Surround, Dolby Digital 5.1, or Dolby Digital Surround EX.
- DTS: DTS 2-Channel, DTS Digital Surround, DTS 96/24, DTS-ES Matrix 6.1, DTS 96/24 ES Matrix, or DTS-ES Discrete 6.1.
- PCM: 2-channel uncompressed digital source format.

NOTE *A digital signal that does not have a supported sampling rate or is compressed PCM will be considered an unrecognized signal and muted.*

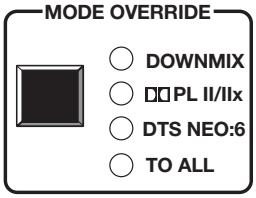
NOTE *When a DVD player is paused during playback, the SSP 7.1 may or may not continue to receive source format information from the DVD player. Some players continue to send the same source format information in a loop, allowing the SSP 7.1 to retain the previous settings. Other DVD players completely disconnect the signal from the SSP 7.1 (unlocked state), so that the active input blinks as if there is no connection present. The remainder of DVD players change the source output to PCM without an actual signal being sent (Digital Silence). During Digital Silence, the PCM LED will light but the 2-CH source LED will not light.*

- 2-Channel (2-CH):
  - Any source coming through analog input #5
  - If a PCM digital signal is present on any of the digital inputs, both the PCM and the 2-CH LEDs light.
  - If a Dolby Digital 2/0 or Dolby Digital 2/0 Surround source is present, both the DD and the 2-CH LEDs light.
  - If a DTS 2-Channel source format is present, both the DTS and the 2-CH LEDs light.

To understand more about source formats, see pages B-2 to B-4 of Appendix B.

Mode Override selection

The SSP 7.1 has a wide range of listening modes, although not all listening modes are compatible with every source format. The system's speaker configuration may further limit which listening mode is available for a source format. Other factors such as the room layout and listener preferences may also influence the listening mode selection.



The SSP 7.1 has default listening modes associated with each source format. The front panel provides the user with a limited set of Mode Override settings. These can change the listening mode that is associated with a specific combination of source format and input. The override selections can be further defined using the SSP 7.1 Setup and Control Software, or SIS commands.

The new, user-defined listening mode will continue to be associated with that source format until Mode Override is used, again, to associate a new listening mode with the source format.

To learn more about listening modes, see "Listening Mode Options" on pages B-6 to B-9 of Appendix B. To learn how listening modes depend on both source format and speaker configuration, see "Source Formats and Listening Modes with Different Speaker Setups" on pages B-15 to B-17.

To select a listening mode:

1. Use the push button to toggle through the available listening modes. If no mode override is selected, none of the LEDs light, indicating that a user-defined listening mode is in use. Otherwise, one of the four LEDs shows the current selection.
2. Release the button when the desired LED is lit to select that listening mode. If a listening mode is not an available option for the current input source, toggling will skip that mode and go to the next available mode.
3. If required, further define the selection using the SSP 7.1 Setup and Control Software (see chapter 5).

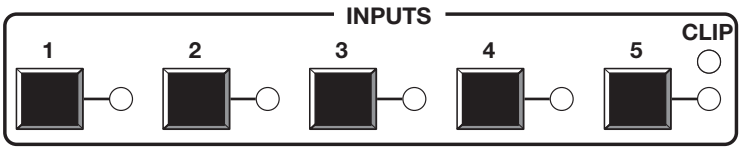
The mode override selections that are available through the front panel are:

- Downmix (DOWNMIX) — downmixes any multi channel source format (digital inputs only). It also downmixes a 2-channel source format, if the listening mode is set to Mono.

  It is further defined from the Setup and Control Software (see chapter 5). Options include:
  - Stereo, output on left front and right front channels.
  - Mono, output to center channel only or to left and right front channels, equally.
- Dolby Pro Logic II/IIx (DOLBY PL II/IIx) — uses Dolby Pro Logic II or Dolby Pro Logic IIx surround processing technology.
  - Dolby Pro Logic II extends 2-channel sources to output 5.1 channels. It can be further defined by control software as either Dolby Pro Logic II Movie (default) or Dolby Pro Logic II Music.
  - Dolby Pro Logic IIx extends 2-channel sources to output 6.0 to 7.1 channels (depending on the speaker setup). It can be further defined by control software as either Dolby Pro Logic IIx Movie or Dolby Pro Logic IIx Music.
  - Dolby Pro Logic IIx also provides an extended surround option for multichannel sources such as DTS Digital Surround or Dolby Digital 5.1.
- DTS Neo:6 (DTS NEO:6) — uses DTS Neo:6 surround processing technology to extend analog or 2-channel digital source formats (PCM, Dolby Digital 2/0, Dolby Digital 2/0 Surround, DTS 2-Channel) to output up to 7.1 channels. It is further defined by control software as either DTS Neo:6 Cinema (default) or DTS Neo:6 Music.
- To All (TO ALL) — distributes a mono or 2-channel source to all applicable channels:
  - Mono sources are sent to all available output channels, including center.
  - 2-channel sources are sent to all stereo pairs only.
  - Multichannel sources are downmixed and output to "Mono to All" or "Stereo to All", as defined by the user.
  - Digital or analog stereo sources may be output to "Mono to All" or "Stereo to All", as defined by the user. If "Mono to All" is selected, the signal is downmixed to mono before being output to all channels.

NOTE *If an analog mono source is on the left channel, "Stereo to All" listening mode outputs only to the left channels of available stereo pairs. A right channel analog mono source is output only to the right channels of available stereo pairs.*

Input selection



The five buttons allow the user to select between five possible audio inputs. The green LED next to the button lights to show which input is currently active.

The SSP 7.1 accepts four digital inputs and one analog input (see Rear Panel Features on page 3-4):

- Inputs 1 and 2 accept digital signals through S/PDIF optical cables. The optical cable will support TosLink® or TosLink compatible optical connectors that conform to IEC-958, S/PDIF standards.
- Inputs 3 and 4 accept digital signals through S/PDIF coaxial cables.

All four digital inputs accept 16-24 bits PCM audio at 32, 44.1, 48, 88.2, and 96 kHz sample rates. They are designed to support Dolby Digital EX, DTS-ES Matrix 6.1, and DTS-ES Discrete 6.1 source formats.

NOTE *For digital inputs, if there is no valid clock signal at the input and no lock is achieved, the LED associated with the source will blink twice per second.*

- Input 5 accepts a balanced or unbalanced analog input through a 5-pin captive screw connector. The unit can be configured to accept
  - o a stereo signal
  - o a mono signal from the right channel
  - o a mono signal from the left channel
  - o a mixed sum of right and left channels

The input can also be selected using the SSP 7.1 Setup and Control Software (see page 5-3).

Mute output

When the mute state is enabled, all channels are muted simultaneously. To toggle between mute and unmute:

1. Press and hold the active input button (the button next to the LED that is lit).
2. While still holding the active input button, press the Mode Override button.

When the mute state is enabled, the individual LEDs of the Volume Adjustment LED bar light in sequence from the top down. This scrolling down pattern repeats while the mute state persists.

NOTE *Selecting another input button while the mute function is enabled, disables the mute function.*

NOTE *Adjusting the volume control encoder to change the volume (or the analog input gain) settings while the mute function is enabled, disables the mute function and increases (or decreases) the volume (or gain) from its previous setting.*

NOTE *If SIS commands have been used to mute a specific channel, muting and unmuting all channels will also unmute the channel that was specifically muted. It will not remain in its previously muted state.*

All channels can also be muted using the SSP 7.1 Setup and Control Software (see page 5-6).

Complete system reset

The SSP 7.1 has three levels of System Reset.

Standard System Reset — all parameters that can be adjusted by the control program are reset to default

Factory Reset — in addition to resetting all the parameters of the standard system reset, the baud rate for communicating with the computer is also reset.

Complete System Reset — in addition to resetting all the parameters of the factory reset, the firmware is reset to the factory-installed version.

The standard and factory resets are performed using SIS commands (see page 6-14).

To perform a complete system reset, hold the Mode Override button while shutting off and restoring power.

Volume adjustment

Use the rotary encoder to adjust the output volume from 0 (-100 dB) to 100 (0 dB). The default setting is 50 (-50 dB).

The degree to which the volume is incremented/decremented for each step the encoder is turned, depends on the current volume setting (see the last column in the table below).

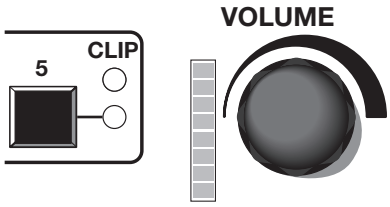
As the volume increases or decreases, the LED bar lights to indicate the current volume range, as shown in the table below. As the volume is increased or decreased within a volume range, the top LED flashes once. If the knob is turned past maximum volume, all 8 LEDs flash, for as long as the knob continues to be turned.

Volume steps for each LED dB)	LEDs lit	Increment (dB/knob step)
>0	All LEDs blink if user tries to turn knob further	
0	All 8 LEDs on	1
-4 to -1	All 8 LEDs on	
-9 to -5	Bottom 7 LEDs on	
-14 to -10	Bottom 6 LEDs on	
-19 to -15	Bottom 5 LEDs on	
-29 to -20	Bottom 4 LEDs on	2
-49 to -30	Bottom 3 LEDs on	4
-69 to -50	Bottom 2 LEDs on	
-99 to -70	Bottom LED on	5
-100	All LEDs off	

The Volume can also be controlled using the SSP 7.1 Setup and Control Software (see page 5-6).

Analog Input Gain adjustment

Alternatively, the rotary encoder controls the gain level of the analog signal on input 5:



1. Press and hold the Input 5 button, while turning the rotary encoder.
2. Adjust the gain from 0 dB (fully counterclockwise) to +24 dB (fully clockwise).

NOTE *If the gain level is turned too high, clipping may occur (depending on the input volume). When clipping occurs, the red LED above the Input 5 button lights.*

The LED bar lights from the bottom up to indicate the current gain level. No LEDs lit indicates no gain (0 dB); all the LEDs lit indicates maximum gain (24 dB). Each solidly lit LED represents 3 dB. A slowly blinking LED indicates an additional 1 dB or a quickly blinking LED indicates an additional 2 dB:

Number of LEDs lit solidly	Gain (dB)		
	No Blinking	Slow Blinking	Fast Blinking
8	24	-	-
7	21	22	23
6	18	19	20
5	15	16	17
4	12	13	14
3	9	10	11
2	6	7	8
1	3	4	5
None	No LEDs lit: 0 dB	1	2

The Analog Input Gain can also be controlled using the SSP 7.1 Setup and Control Software (see page 5-4).

Front Panel Security Lockout (Executive mode)

When Front Panel Security Lockout is enabled, the user is unable to change the input selection or adjust the volume from the front panel. If the user attempts to change either, with this feature enabled, all the input LEDs will flash simultaneously. The lockout does not block changes made using SIS commands or the SSP 7.1 Setup and Control Software. To enable this feature:

1. Press and hold the active input button (the button next to the LED that is lit).
2. While still holding the active input button, press and hold any other input button. All the LEDs blink in ascending order (from 1 to 5) and then the active input button lights.
3. The feature is disabled in exactly the same way. All the LEDs blink in descending order (5 first and 1 last) and then the active input button lights.

The Front Panel Security Lockout can also be set, using the SSP 7.1 Setup and Control Software (see page 5-17).

SSP 7.1

Chapter Four

Setup

Setup Options

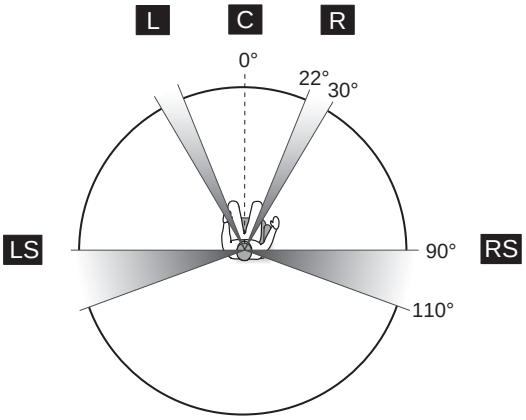
Setup Options

Chapter 3 describes some basic configuration that can be carried out using the front panel controls of the SSP 7.1. The SSP 7.1 Setup and Control Software offers all of those choices and additional options that are not available through the front panel. Extron strongly recommends that the Control Program is used to make any configuration changes to the SSP 7.1. (See chapter 5, "SSP 7.1 Setup and Control Software").

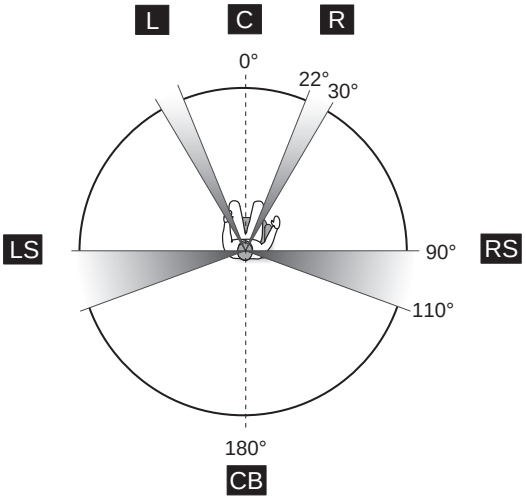
Speaker setup

The following figures show the recommended speaker placement, relative to the listener, for a five, six, or seven speaker system and for subwoofer placement.

NOTE *All speakers should be angled inwards so that they face towards the listener.*



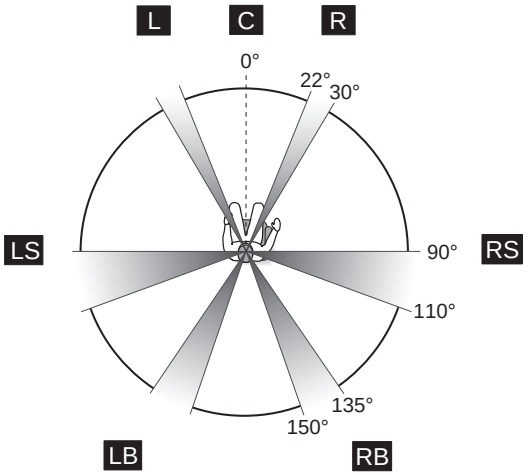
Five Speaker Setup



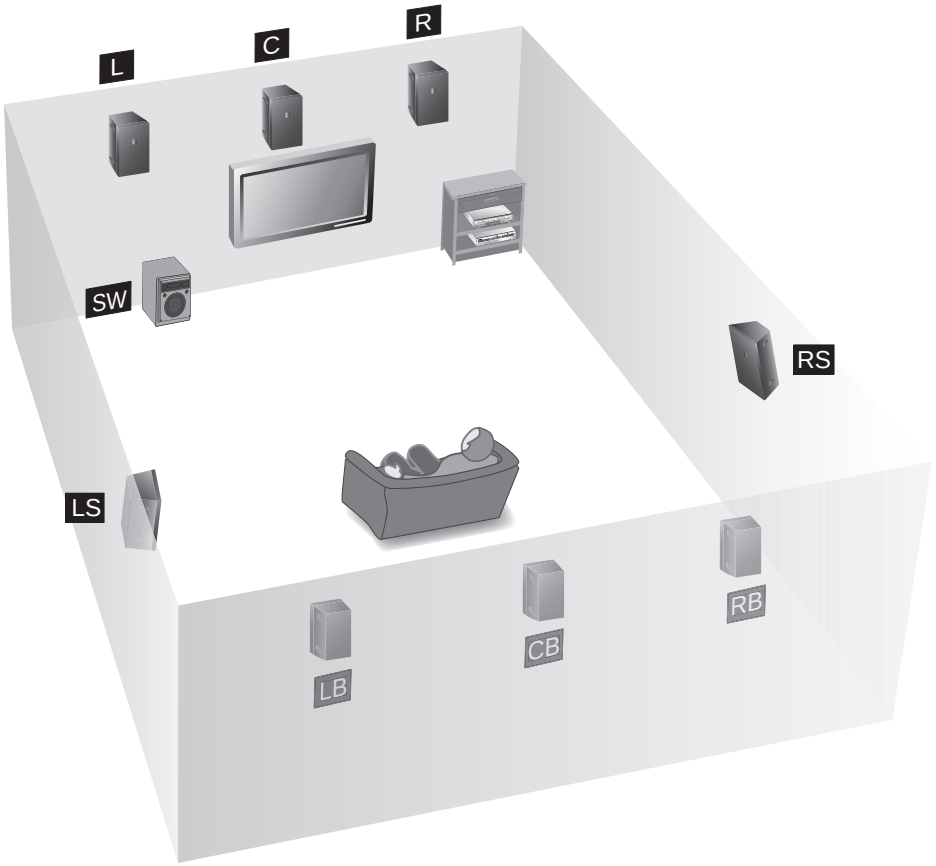
Six Speaker Setup

Abbreviations

C = Center; CB = Center Back (Six Speaker Setup only); L = Left; LB = Left Back (Seven Speaker Setup only); LS = Left Side; R = Right; RB = Right Back (Seven Speaker Setup only); RS = Right Side; SW = Subwoofer



Seven Speaker Setup



Subwoofer placement

NOTE *To produce a good bass response from the subwoofer, it should be located at the front of the listening room, somewhere between either corner and a point about one third of the way along the front wall.*

NOTE *The output channel used for the Left Back speaker (in 7.1 configurations) is also used for the Center Back speaker (in 6.1 configurations).*

Bass Management

Low frequency sounds are usually better handled by the subwoofer speaker. Bass Management handles the low frequency component of input signals, along with the Low Frequency Effects (LFE) information encoded in the source format and passes that information to a subwoofer (if available) and to speakers set to Large.

Speaker size settings

This feature sets whether Bass Management is on or off for a particular speaker, which defines the frequency range that is output from that speaker. These settings also enable or disable the subwoofer and set the crossover frequency.

- Left and Right Front speakers and Left and Right Surround Speakers are set in pairs.
- The Center speaker is set as an individual speaker.
- Back Surround speaker(s) can be set as a single speaker or as a pair of speakers, depending on the system configuration.

Small

Bass Management is on for that speaker. The output to each speaker (other than the subwoofer) is limited to frequencies above the Crossover Frequency. By default, center and side speakers are set to small.

Large

Bass Management is off for that speaker. This mode allows the full range of audio frequencies from the audio source to be fed through the individual channel's output. This is sometimes set in the absence of a subwoofer as part of the system. By default, front speakers are set to large.

All speakers set to Large, except the Center channel, will receive the summed audio from the filtered low frequency signals from speakers set to Small.

None

This mode prevents any signal being sent to that channel's output. It is not an option for front speakers.

One Small Speaker, Two Small Speakers, One Large Speaker, Two Large Speakers, or None

(Surround back speakers only)

This mode determines whether the audio output channels for the back speaker(s) will be passed to the Left Back and Right Back (in 7.1 setups) or to the Center Back (in 6.1 setups).

If either of the one speaker options are chosen, the highest possible number of outputs is 6.1 speakers. In this case, the output is directed to the left back channel.

If either of the two speaker options are chosen, the SSP 7.1 is able to output up to 7.1 channels. Source formats with discrete or matrix mixed 6.1 encoded channels will output the surround back channel signal equally to the left and right back channels. Dolby Pro Logic IIx listening mode option will output a stereo signal to the left and right back channels.

NOTE *If the side surround speakers have been disabled, the back speaker options will also be disabled.*

By default, the back speaker is set to none, which prevents a signal being output on the back channel(s).

Subwoofer

This option allows the subwoofer to be enabled or disabled. When the subwoofer is enabled, the signal contains filtered low frequency signals from speakers set to small in addition to the LFE signal from the source format. If the subwoofer is absent or disabled, the LFE signal is mixed with the bass information of all speakers in the system that are set to large, except the center speaker.

NOTE *When the Surround Side and Surround Back speakers are set to None, all multichannel input signal formats are downmixed and output on all the system's remaining channels.*

In addition, in the absence of a Center channel, mono signals, are output equally between the Front Left and Front Right channels. Multichannel sources are downmixed to all remaining channels, but Mono to All and Stereo to All options are disabled. Choosing Mono listening mode will first downmix the multichannel source and output it to front left and right channels equally as a dual mono signal.

Crossover Frequency

The Crossover Frequency sets the boundary below which the low frequency signals from designated output channels are incorporated into Bass Management. Low frequency signals are only taken from speakers that have been set to Small (see Speaker size settings, above). The Bass Management signal is passed to the subwoofer (if present) and speakers that have been set to Large (except for the center speakers).

The crossover frequency can be adjusted within the range of 40 Hz to 250 Hz, with a default setting of 100 Hz. Speakers set to small (see "Speaker size settings", on the opposite page) will play only signals above the set frequency.

NOTE *The LFE information from a multi-channel source format is not affected by the Crossover Frequency. The LFE info is mixed with low passed signals from speakers set to Small after the Low Pass Filter is applied to those speakers.*

Speaker delay settings

The speaker delay settings adjust the signal delay for each speaker individually (from 0 to 100 ms). The default setting for each speaker is 0 ms. The two main reasons to adjust the signal delay are:

Compensation Delay — In a room where speakers are not equidistant from the listener, sound from the closest speaker reaches the listener before sound from the farthest speaker. This adjustment delays the signals going to individual speakers: the signal to the speaker farthest from the listener is not delayed while speakers that are closer to the listener, are delayed more. This ensures that the sound from each speaker reaches the listener at the same time.

Lip Sync Offset — Processing video signals often delays the video signal, relative to the audio signal. The Lip Sync Offset delays audio signals to every output channel by the same amount to compensate for the delay to the video signal and to resynchronize the audio and video outputs.

If a particular setup requires both types of compensation, it is recommended that the individual speaker's compensation delay is set first before readjusting all speakers for Lip Sync offset.

NOTE *The total speaker delay (Compensation Delay + Lip Sync Offset) must not exceed 100 ms.*

To configure these settings using the SSP 7.1 Setup and Control Software, see page 5-9.

Test Signals

Test signals are used during setup to calibrate each channel's levels and to ensure proper connection between the SSP 7.1's individual output channels and the line level input channels of an audio signal processor, a receiver with built in amplifier, or a stand alone amplifier that will power the loudspeakers.

The three options for test source are pink noise, Dolby noise, and an external source. By default, the test signal is switched off.

Pink Noise

Pink noise is a random signal with all audio frequencies present, that is generated by the SSP 7.1. It provides equal energy per octave to provide a flat response over all frequencies. The main purpose of pink noise is to calibrate the speaker's interaction with its given environment.

Dolby Noise

Dolby noise provides a bandpass-filtered noise, centered at 750 Hz with a 12 dB/octave role off. This signal is also generated by the SSP 7.1 and is used to set speakers to the same level when calibrating the room.

External

This option requires an external calibration source, such as an audio calibration disk that is played through a selected input source. These calibration disks are usually used to test specific decoding mode outputs and when the External Source option is chosen, the speakers that receive the test signal can be specified.

To calibrate speaker output, using any of these test signals with the SSP 7.1 Setup and Control Software, see page 5-12.

Output Channel Trim settings

This control adjusts the output channel trim level for each output channel to match the levels to the unique needs of any listening environment. The level can be adjusted within the range from -24 dB to +12 dB. The default setting for each speaker is 0 dB.

NOTE *When the level is set above 0 dB, the Output Volume control is reduced by an equivalent amount to prevent the possibility of clipping.*

Listening Mode settings

The SSP 7.1 provides a range of settings that refine the sound distribution for each listening mode, depending on the decoding mode that has been selected.

Dolby Pro Logic II or IIx Music

Dimension control

This feature alters the ratio of L+R to L-R for two-channel input signals, which adjusts the sound field towards the front or towards the back. The available settings are front, neutral, or back. The default setting is neutral.

Center width control

Pro Logic decoding produces a single center signal that comes from the center speaker. If there is no center speaker, a "phantom" center image is produced that is split between the right and left speakers.

If right, left, and center speakers are present, center width control allows variable adjustment of the center image so that is heard only from the center speaker, only from the right and left speakers, or from all three speakers in varying degrees.

There are up to eight different settings, with each corresponding to a specific calculation angle (Φ). When the setting is 0, the sound comes from the center speaker, when the setting is 7, the sound is from the L/R speakers. The default setting is 3.

Control Position	Calculation Angle (Φ)	C Level (dB)	L/R Level (dB)
0	0	0.0	Off
1	20.8	-0.6	-12.0
2	28.0	-1.1	-9.6
3	36.0	-1.8	-7.6
4	54.0	-4.6	-4.8
5	62.0	-6.6	-4.1
6	69.2	-9.0	-3.6
7	90.0	Off	-3.0

NOTE *The level of the center speaker (C Level) is related to cosine Φ. The level of the left and right speakers (L/R Level) is related to sine Φ.*

Panorama control

This feature extends the Center Width Control, so that all or part of the center image can be heard from the side surround speakers for a "wraparound" effect. The feature may be on or off. The default setting is Off.

DTS Neo:6 Music or Cinema

Center image control

The Center Image control varies the amount of attenuation applied to the Left and Right channel information of the input source that is used for creating the output Center channel effects. When it is set to 0, the mixed input signal information, intended for use in creating the Center output channel of the DTS Neo:6 listening modes, is filtered back to the Front Left and Right output channels. This creates the effect of spreading the centralized audio signal across all three front output channels. When this control is set to 10, the matrixed information intended for the Center output channel effects is fully attenuated, allowing the Center channel to dominate and creating a more centralized effect from the front channels.

The default setting for DTS Neo6: Music is 3. The default setting for DTS Neo6: Cinema is 10.

Dynamic Range Compression control

(Only with Dolby Digital and DTS source formats that have a Dynamic Range Compression flag)

This control adjusts the gain applied to Dolby Digital or DTS listening modes to compress the signal outputs during the decoding process. The three possible settings are none, minimum, and maximum. The default setting is None.

None

The signal is uncompressed and is played with the full original dynamic range.

Minimum

The audio is partially compressed. In this mode, the volume of the loudest passages is reduced but quieter passages are kept at their original level. This level is recommended for normal listening.

Maximum

The audio is fully compressed. This level is recommended for environments where loud audio is not permitted.

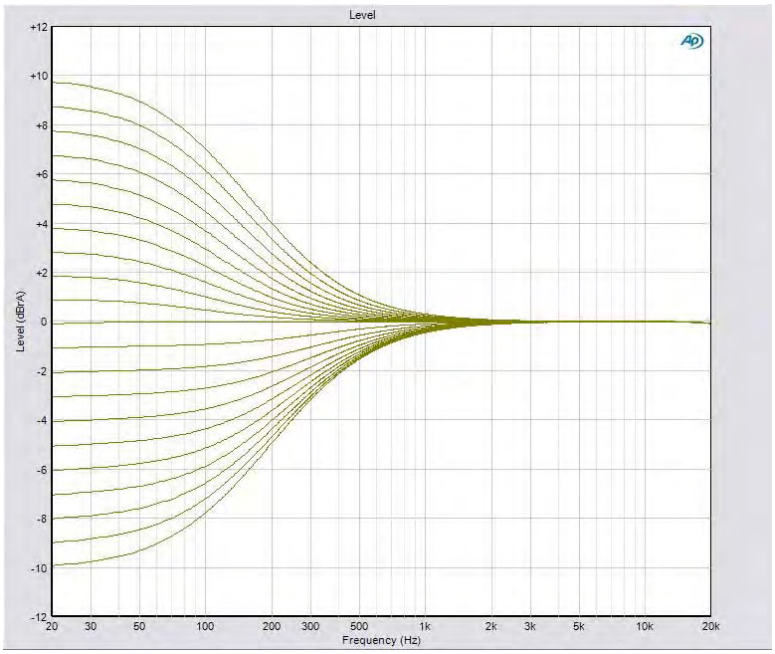
NOTE *DTS source formats have only two states (on and off) for dynamic range compression. Therefore, minimum and maximum both apply the same dynamic range compression.*

Tone Controls

These controls regulate the Bass and Treble settings for the system. To adjust the bass or treble tone controls, see page 5-4.

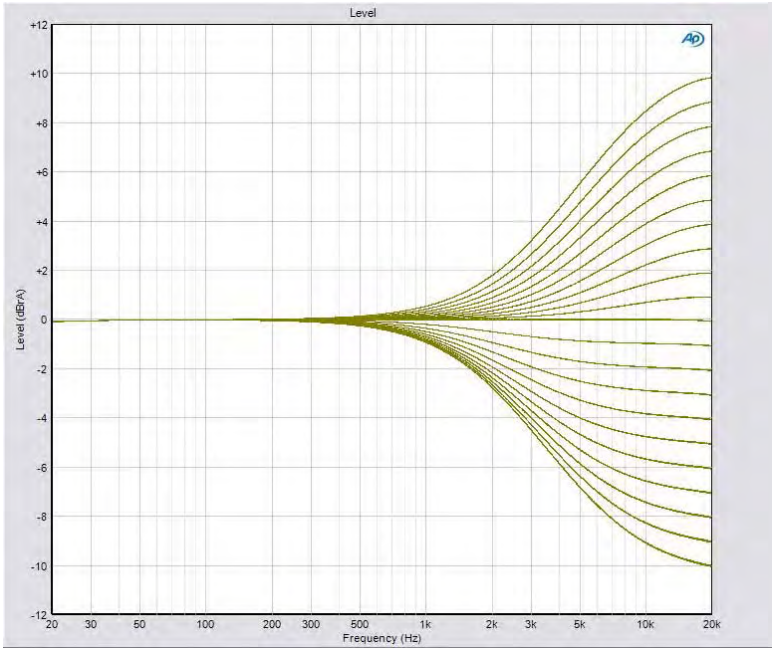
Bass

The Bass control regulates the amount by which low frequency signals are boosted or cut (see figure below). It is applied to outputs for all speakers, including the subwoofer.



Treble

The Treble control regulates the amount by which high frequency signals for all speakers, except the subwoofer, are boosted or cut (see figure below).



Volume Output

This control sets the volume of the audio output through all channels, globally, to either Variable (the default value) or Fixed.

Variable

When the Volume output is set to Variable, the volume can be attenuated using the front panel knob, the SSP 7.1 Setup and Control Software, or SIS commands.

Fixed

The Fixed option sets the volume to the current attenuation level. Likewise, all the Output Channel Trim levels (see page 4-6) are fixed at the values they had immediately before the Volume Output was set to Fixed.

When "Fixed" is selected, the volume cannot be adjusted through the front panel knob, by the SSP 7.1 Setup and Control Software, or by SIS commands.

Chapter Five

SSP 7.1 Setup and Control Software

About the SSP 7.1 Setup and Control Software

Installing the SSP 7.1 Setup and Control Software

Running the SSP 7.1 Setup and Control Software

SSP 7.1 Setup and Control Software Help File

Firmware Updates

SSP 7.1 Setup and Control Software

About the SSP 7.1 Setup and Control Software

The SSP 7.1 Setup and Control Software provides an intuitive, easy to operate, graphical user interface that allows the user to configure the audio system quickly and efficiently. It provides more options than the front panel. The options are automatically updated in real time so that, as selections are made, only the options that are currently available to the SSP 7.1 can be accessed. Extron strongly recommends using the SSP 7.1 Setup and Control Software for all configuration.

The program comes on a disk, supplied with the unit, or it can be downloaded, free of charge, from the Extron Web site (www.extron.com).

Installing the SSP 7.1 Setup and Control Software

The minimum system requirements for installing the program on the computer are:

- **Operating System** — Microsoft® Windows® 2000 or higher.
- **CPU** — Intel® Pentium® II processor with a 400 MHz clock speed or faster.
- **Hard Disk space** — At least 10 MB
- **Memory** — At least 64 MB of RAM
- **Device connection** — Serial COMM Port

Insert the disk provided into the computer's CD/DVD ROM drive. If the setup program does not start automatically, run Launch.exe from the CD/DVD ROM directory in Windows "My Computer". Select the **Software** tab, locate the SSP 7.1 Setup and Control Software, and click **Install**. Follow the on-screen instructions to install the program.

Alternatively, go to the Extron Web site, click on the **Download** tab, and click on the **Software** option in the left sidebar. Navigate to the SSP 7.1 Setup and Control Software and click **Download**. Follow the on-screen instructions to install the program.

By default, the Installer program creates a C:\Program Files\Extron\SSP7.1 folder to contain the SSP 7.1 Setup and Control Software. An icon may also be placed on the Windows desktop.

SSP7.1

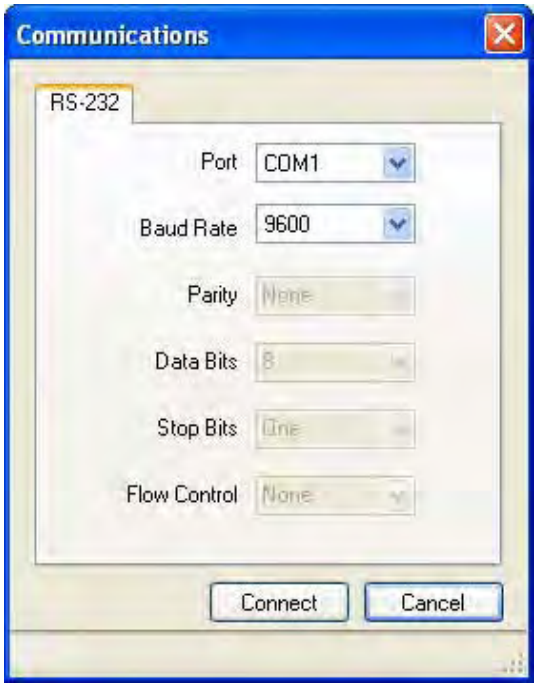
Running the SSP 7.1 Setup and Control Software

The computer must be connected to the SSP 7.1 using either the RS-232 captive screw connectors on the rear panel or the Config port on the front panel.

To start the program, click on the desk-top icon or click on the Windows **Start** button and select **All Programs** > **Extron Electronics** > **SSP7.1** > **SSP7.1**. The "Communications" dialog box (shown at right) opens.

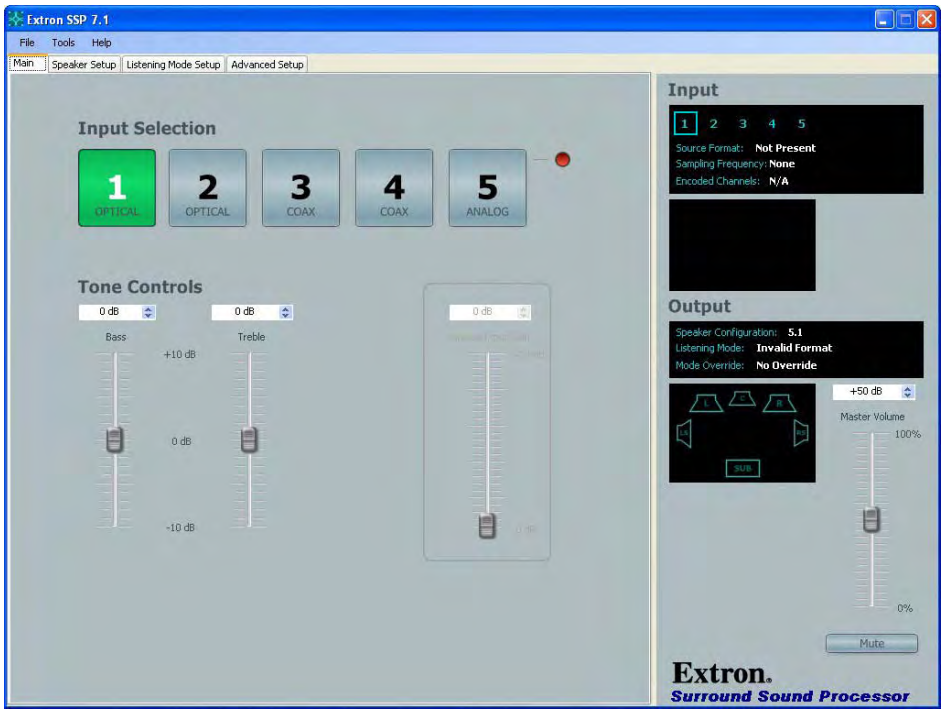
Select the correct Port and Baud Rate (default 9600).

Click the **Connect** button.



Main Tab

The program will open with the **Main** tab selected. Three other tabs are available (**Speaker Setup, Listening Mode Setup,** and **Advanced Setup**). It is advisable to configure each screen in the sequence they appear at the top of the screen. Full instructions on how to configure each screen are available in the Help File, which can be accessed under the Help menu option or by pressing F1 from within the program.

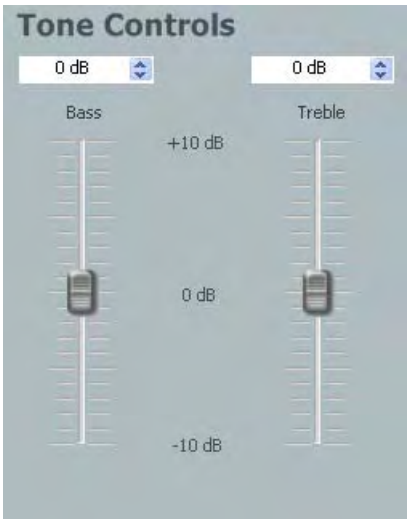


The **Main** tab offers the options that are available on the SSP 7.1 front panel:

Input source

The five buttons allow the user to select between five possible audio inputs: four digital inputs and one analog input. The button lights green to show the currently active input. Further information about the input sources is available on page 3-6.

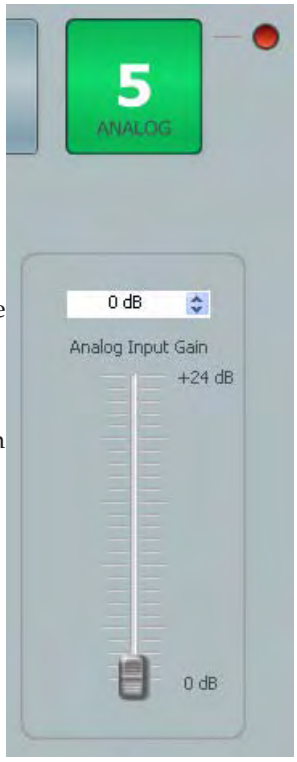
Tone Controls



Bass control adjusts the amount of low-frequency boost or cut applied to the audio outputs for all speakers, including the subwoofer. Treble control adjusts the amount of high-frequency boost or cut applied to the audio outputs for all speakers, except the subwoofer. Both controls are adjustable between -10 dB and +10 dB and the current value is shown in the text box. Adjust the value in any of these ways:

- Grab and drag the slider bar to adjust tone in 1 dB increments. Clicking on the control (the vertical white line, not the bar) will increment or decrement the value by 5 dB, depending on whether the click was above or below the bar.
- Click on the tone control to bring it into focus and then use the up and down arrows beside the text box to adjust the tone in 1 dB increments.
- With the tone control in focus, use the up and down keys on the keyboard to adjust the tone in 1 dB increments.
- Alternatively, with the tone control in focus, use the page up and page down keys on the keyboard to adjust the tone in 5 dB increments.

Analog Input Gain



This control is only available when input 5 (analog) is selected. It is locked and cannot be adjusted when inputs 1-4 are selected.

The Analog Input Gain control allows the gain to be adjusted between 0 dB and +24 dB. The current setting is displayed in the text box.

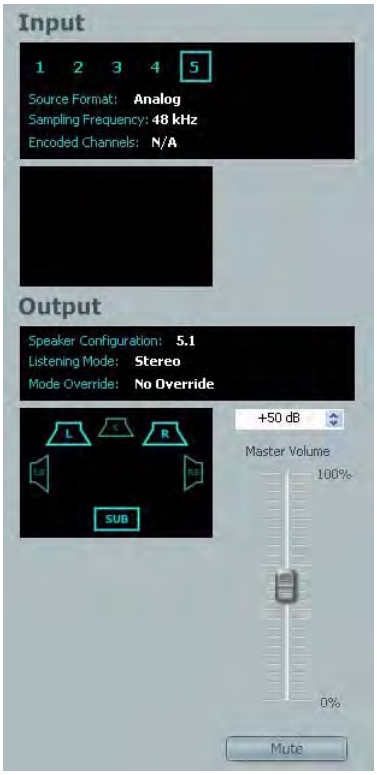
The gain can be changed in any of the following ways:

- Grab and drag the slider bar to adjust gain in 1 dB increments. Clicking on the control (the vertical white line, not the bar) will increment or decrement the value by 5 dB, depending on whether the click was above or below the bar.
- Click on the gain control to bring it into focus and then use the up and down arrows beside the text box to adjust the gain in 1 dB increments.
- With the gain control in focus, use the up and down keys on the keyboard to adjust the gain in 1 dB increments.
- Alternatively, with the gain control in focus, use the page up and page down keys on the keyboard to adjust the gain in 5 dB increments.

The red virtual LED lights when the input level goes above 0 dBFS, indicating that the input level is too high.

NOTE *If the gain level is turned too high, clipping may occur (depending on the input volume). When clipping occurs, the red virtual LED beside Input 5 button lights.*

Input/Output Information Bar

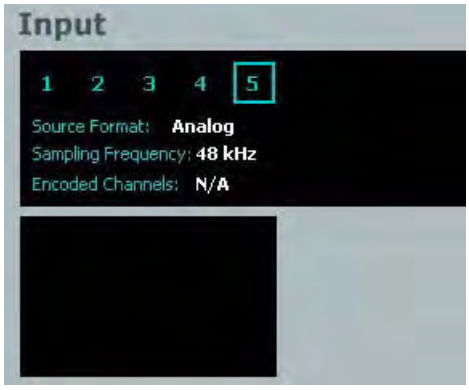


The Input/Output Information Bar, on the right side of the screen, is visible in all tabs and provides information about:

- The current input
  - o Selected input channel
  - o Source format
  - o Sampling frequency
  - o Encoded channels
- The current output
  - o Speaker configuration
  - o Listening mode
  - o Mode override selection
- Master volume
- Mute

NOTE *While the Master Volume value and Mute status can be adjusted using the slider bar and button in this panel, the Input and Output status information in this information bar is read only.*

Input status



The input text box indicates the source format (first line), the sampling frequency (second line), and encoded channels (third line).

The graphics box underneath highlights the audio source's active channels in blue:

L = Left front
C = Center
R = Right front
LS = Left surround side
RS = Right surround side
S = Surround (only available with 3/1 or 2/1 sources): LS and RS carry a mono surround signal.
SB = Surround back
LFE = Low Frequency Effect (primarily used for subwoofer channel output)

Further information about the source format configuration from the SSP 7.1 front panel can be found on page 3-6. To understand more about source formats, see pages B-2 to B-4.

Output status

A text box indicates the speaker configuration (first line), the current listening mode (second line), and the mode override status (third line).

Underneath, a graphics box shows the current speaker configuration. Speakers that are available are highlighted in blue and speakers that are not available are not shown.

Speakers that are set to large (see Speaker Configuration on the next page) are represented by large icons and speakers that are set to small are represented by small icons.

Speakers that are present but have been muted are shown in red.

Master Volume and Mute

The Output status section of the screen also contains the Master Volume adjustment and the Mute button.

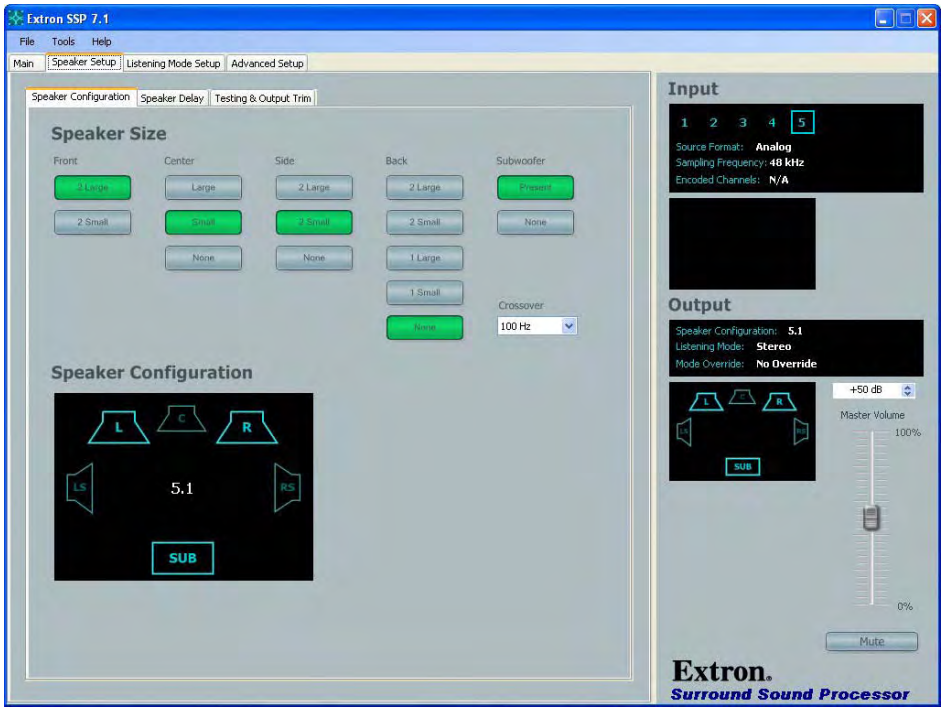
The Master Volume can be adjusted between 0 (-100 dB) and 100 (0 dB). The current volume setting is displayed in the text box. The volume can be changed in any of the following ways:

- Grab and drag the slider bar to adjust volume in 1 dB steps. Clicking on the control (the vertical white line, not the bar) will increment or decrement the value by 5 dB, depending on whether the click was above or below the bar.
- Click on the volume control to bring it into focus and then use the up and down arrows beside the text box to adjust the volume in 1 dB steps.
- With the volume control in focus, use the up and down keys on the keyboard to adjust the volume in 1 dB steps.
- Alternatively, with the volume control in focus, use the page up and page down keys on the keyboard to adjust the volume in 5 dB steps.

The **Mute** button mutes/unmutes all channel outputs.

Speaker Setup Tab

After completing the **Main** tab, the next tab is **Speaker Setup,** which is the first tab to allow system configuration that is not available from the front panel. The Speaker Setup tab provides access to three other tabs (**Speaker Configuration**, **Speaker Delay**, and **Testing and Output Trim**).



Speaker Configuration tab (second level tab)

Speaker size

Speaker size determines whether or not Bass Management applies to that speaker. For more information about Bass Management and speaker size, see pages 4-4 and 4-5.

Speaker size settings

All the buttons in a single column represent mutually exclusive choices. Only one selection can be made from each column. For example, Front Speaker Size must be set to either **2 Large** or **2 Small**. It cannot be set to both values or neither value.

- Left and Right Front speakers and Left and Right Side Speakers are set in pairs.

- The Center speaker is set as an individual speaker.
- Back Surround speaker(s) can be set as a single speaker or as a pair of speakers, depending on the system configuration.
- The Subwoofer can be set to **Present** or **None**.

Small — Bass management is on (see page 4-4).

Large — Bass management is off (see page 4-4).

None — No signal is sent to that channel's output, effectively removing the speaker from the current configuration. It is not an option for front speakers.

One Small Speaker, Two Small Speakers, One Large Speaker, Two Large Speakers, or None *(Surround back speakers only)* — This option determines whether the audio output channels for the back speaker(s) will be output to the Left Back and Right Back (in 7.1 setups) or to the Center Back (in 6.1 setups). For more information, see page 4-4.

Subwoofer — This option allows the subwoofer to be enabled or disabled. For more information, see page 4-5.

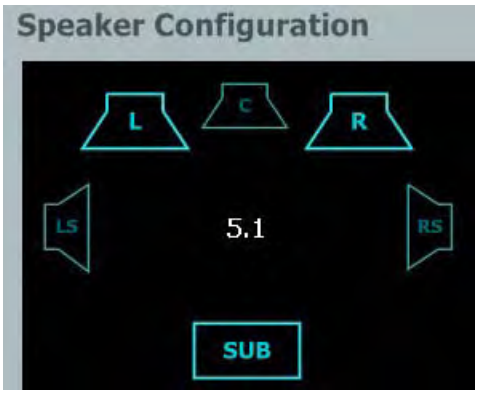
Crossover

The Crossover Frequency sets the boundary below which the low frequency signals from designated output channels are incorporated into Bass Management. For more information, see page 4-5. The crossover frequency is adjustable using the drop-down menu:

- From 40 - 80 Hz, increment and decrement in 5 Hz steps
- From 80 - 150 Hz, increment and decrement in 10 Hz steps
- From 150 - 250 Hz, increment and decrement in 25 Hz steps

Speaker configuration

The speaker configuration is displayed in a graphics box that is very similar to the graphics box shown in the Input/Output Status bar.



Only the speakers available in the current configuration will be displayed.

If the speakers are set to Large, they will be represented by large icons, as shown in the figure at right. If the speakers are set to Small, they will be represented by small icons.

If the speakers are set to none, they will not be available in the current configuration and will not be displayed.

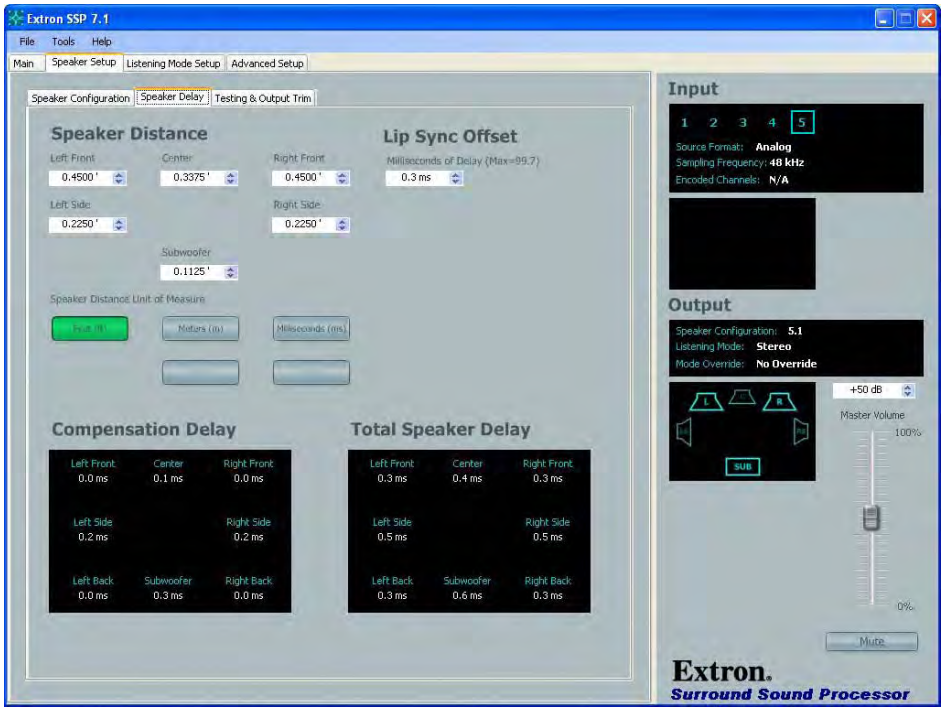
If the back speakers are set to 1 Large or 1 Small, the CB speaker, but not the LB and RB speakers, will be shown (6.1 setups). If the back speakers are set to 2 Large or 2 Small, the LB and RB speakers, but not the CB speaker, will be shown (7.1 setups).

Input/Output information bar

The Input/Output Status bar is available from all GUI tabs and is described in detail on page 5-5.

Speaker Delay tab (second level tab)

After completing the **Speaker Configuration** tab, configure the **Speaker Delay** tab.

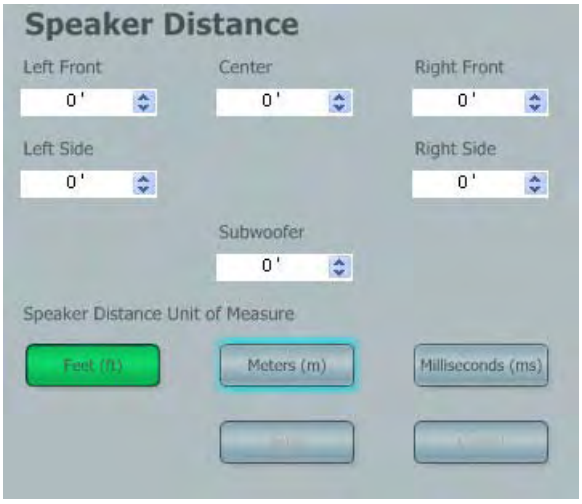


These controls introduce a signal delay for each speaker that has not had its size value set to "None". The two main reasons to adjust the signal delay are:

- To compensate for unequal distances between the speakers and the listener, which causes sound from different speakers to reach the listener at different times.
- To compensate for a lack of coordination between the audio and the accompanying video signal.

Speaker Distance

When speakers are not equidistant from the listener, the sound from the closest speaker reaches the listener before the sound from the farthest speaker. These settings delay the signals going to each individual speaker (from 0 to 100 ms) so that the signals from all the speakers are synchronized when they reach the listener. The default setting for each speaker is 0 ms.



Speakers that are not available in the current configuration are not displayed. When the back surround is set to one speaker, the RB speaker will be unavailable and the LB speaker will be renamed CB.

Extron recommends that the SSP 7.1 Setup and Control Software is used to set speaker delays, using either of the following methods:

Two person setup (without Lip Sync Offset)

NOTE *Setting up speaker delays is easier with two people. If only one person is available, the position of the listener's ears must be marked precisely. For example a pile of boxes could be used. Do not try to guess ear positions, as this will introduce measurement errors.*

1. Pick an ideal central location on which all speaker output signals converge.
2. Use a tape measure to measure the distance from each speaker to the convergence location. Be sure to measure to the same spot from each speaker.

   NOTE *Measurements from the speaker must be to the midrange driver in a three-way speaker or from halfway between the tweeter and the woofer in a two-way speaker. Measurements to the convergence locations must be at ear height.*

3. Select the Feet or Meters button and enter the Speaker Distance values for each speaker (in feet or meters) in the boxes in the SSP 7.1 Setup and Control Software **Speaker Delay** tab. The up/down (▲▼) arrows increase the distance in increments corresponding to steps of 0.1 ms (0.12 feet or 0.03 meters). The software automatically selects the farthest speaker and calculates the delay time (in milliseconds) for each speaker.

   These values are shown in the Compensation Delay and Total Speaker Delay (read-only) boxes. The current values are shown in white, changes (yet to be saved) are shown in orange. The values shown in the Total Speaker Delay box are the values in the Compensation Delay box with the Lip Sync Offset value (see the opposite page) added.

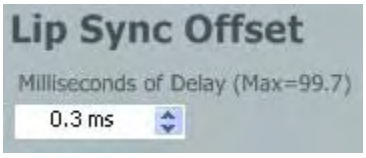
4. Click the **Apply** button to save the changes. The new values (previously in orange) will be shown in white as the current values and there will be no values displayed in orange.

NOTE *To retain the original values, click* **Cancel**, *instead of* **Apply**.

NOTE *Users who wish to calculate the delay time for themselves should follow the full procedure shown on page 6-15.*

Setup with a Real Time Analyzer (RTA) calibration tool (without Lip Sync Offset)

1. Pick an ideal central location on which all speaker output signals converge.
2. Place the microphone from the RTA at ear level in the convergence location.
3. Play the audio source. This can be an analog source, provided by the RTA, or a digital source, provided by a test CD.
4. Use the Test Signal Output buttons in the **Testing and Trim** Tab (see page 5-12) to select which speakers will be tested and the order in which the speakers will be tested.
5. Use the RTA to measure the Speaker Distance (in ms) for each channel.
6. In the SSP 7.1 Setup and Control Software **Speaker Delay** tab, check the milliseconds (ms) button and enter the values for each speaker (in ms) into the boxes. The up/down (▲▼) arrows increase the distance in increments of 0.1 ms.
7. Repeat steps **4** to **6** until the speaker distance has been entered for all available speakers.



Compensating for Lip Sync Offset

Lip Sync Offset compensates for a lack of coordination between the audio and the accompanying video signal (see page 4-5). Enter the appropriate value in the Lip Sync Offset box. This delay is added to every available speaker to resynchronize the video and audio signals.

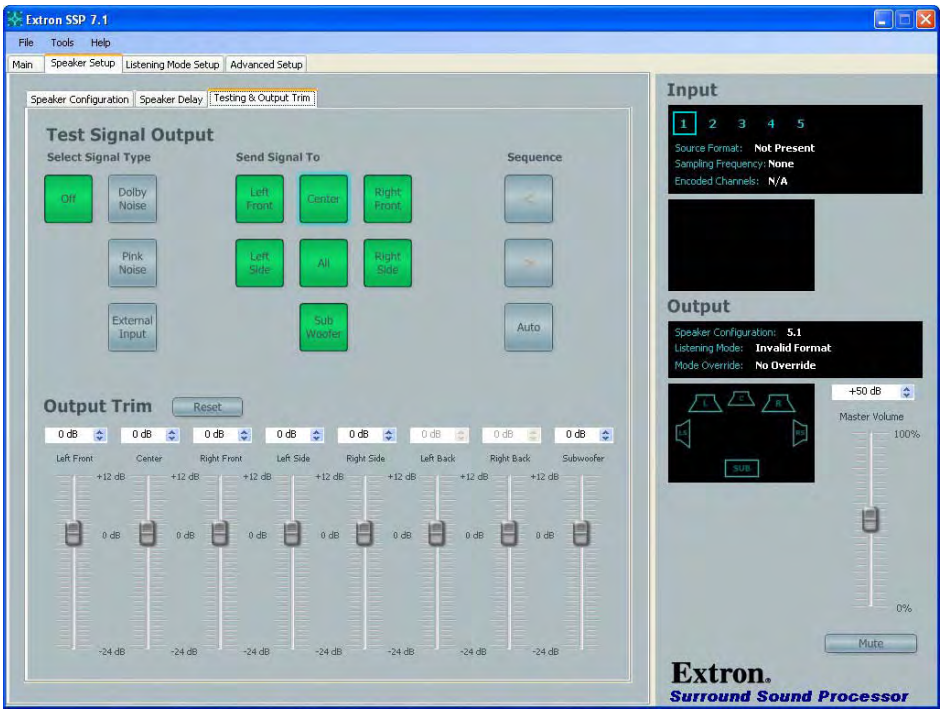
NOTE *The total speaker delay (Compensation Delay + Lip Sync Offset) must not exceed 100 ms.*

Input/Output information bar

The Input/Output Status bar is available from all GUI tabs and is described in detail on page 5-5.

Testing and Output Trim tab (second level tab)

After the **Speaker Delay** tab, configure the **Testing and Output Trim Mode** tab.



The **Testing and Output Trim** tab provides a Test signal utility and also allows the output trims for each individual speaker to be set.

Test signals

Test signals are used during setup to calibrate each channel's levels and to ensure proper connection between the SSP 7.1's individual output channels and the line level input channels of an audio signal processor, a receiver with built in amplifier, or a stand alone amplifier that will power the loudspeakers.

Selecting test signal source

There are four test signal options: **Off**, **Dolby Noise**, **Pink Noise**, or **External Input**. They are selected from the mutually exclusive Source Signal Type buttons. By default, the test signal is **Off.** The **Dolby Noise** and **Pink Noise** test signals are generated by the SSP 7.1 (see page 4-6).

NOTE *The External Source selection is normally used with an analog source on input 5. The output must be set to "Mono to All".*

Set the external source to "Mono to All" as follows:

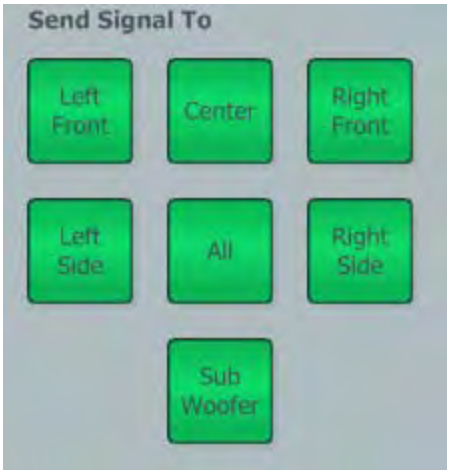
1. Select the Listening Modes tab.
2. Select the Input channel that is providing the test signal source (1-5).
3. For whatever source format the test signal is using, select "Mono to All".
4. In the Listening Mode Override section, for the "To All" override mode, select "Mono to All".
5. Return to the "Testing and Output Trim" tab and click on "External Input".

Selecting speakers to be tested

The currently available speakers are displayed in a graphics box. Speakers that are not available are not displayed.

Click on the individual speaker to select or deselect it from the list of speakers to be tested. Click on **All** to select all speakers.

NOTE *If all speakers have been selected, clicking on* **All** *will deselect all speakers.*



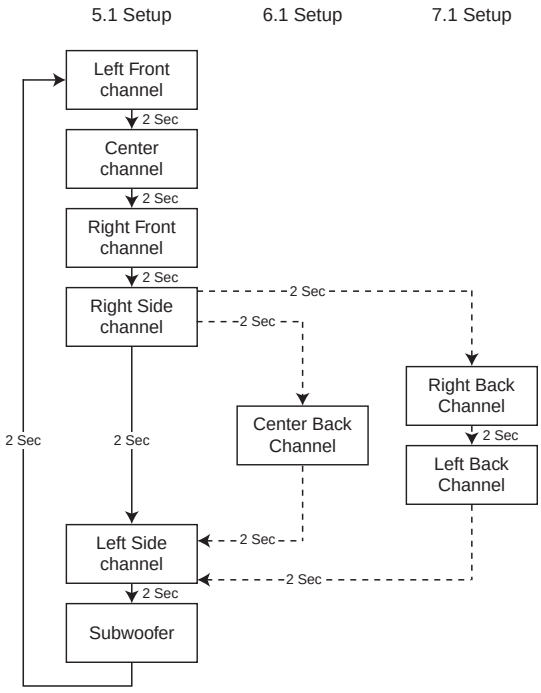
Speaker test sequence

To run an automatic test sequence

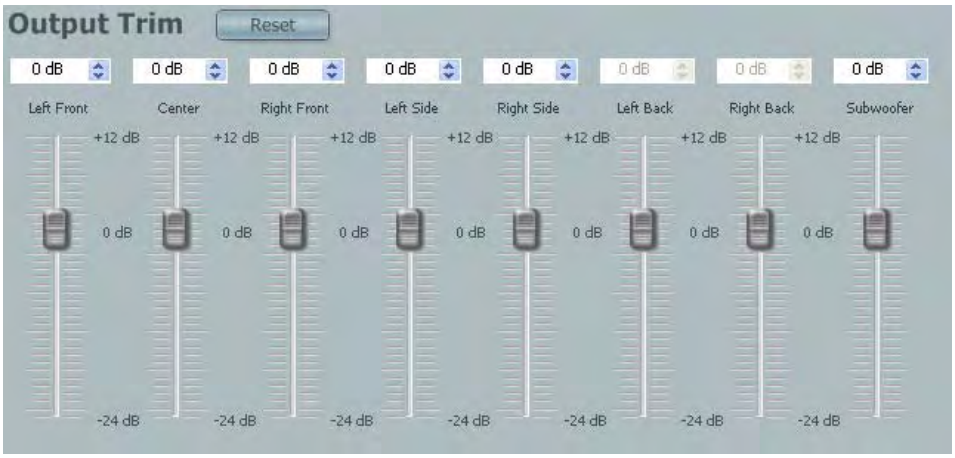
1. Select the **Auto** button. This sends a two second test signal to each speaker in the sequence shown in the diagram at the bottom of the page. All other speakers are muted. If a channel does not have a speaker connected, that channel will be skipped and the test signal will go to the next available channel with a speaker.
2. The test sequence will continue to cycle through each of the speakers multiple times if the test signal is not switched off. Click on **Off** in the "Select Signal Type" area to switch off the test signal and end the test sequence.

To test the speakers manually:

1. Click on **Auto** to deselect it
2. Click on the forward (**>**) or back (**<**) buttons to move forward or backward through the sequence shown in the diagram below.
3. Click on **Off** in the "Select Signal Type" area to switch off the test signal and end the test sequence.



Output Trim



The Output Trim sliders control the level of individual audio signals for each channel output. Only channels that are available in the current speaker configuration are available; the others are grayed out. Output trim is adjustable between -24 dB and +12 dB. The current value for each output channel is shown in the text box.

Send test signals, generated as described above, to each individual speaker. Adjust the output trim for each speaker as follows:

1. Grab and drag the slider bar to adjust output trim in 1 dB increments.
2. Click on the output trim control to bring it into focus and then use the up and down arrows beside the text box to adjust it in 1 dB increments.
3. With the output trim control in focus, use the up and down keys on the keyboard to adjust it in 1 dB increments.
4. Alternatively, with the output trim control in focus, use the page up and page down keys on the keyboard to adjust it in 5 dB increments.

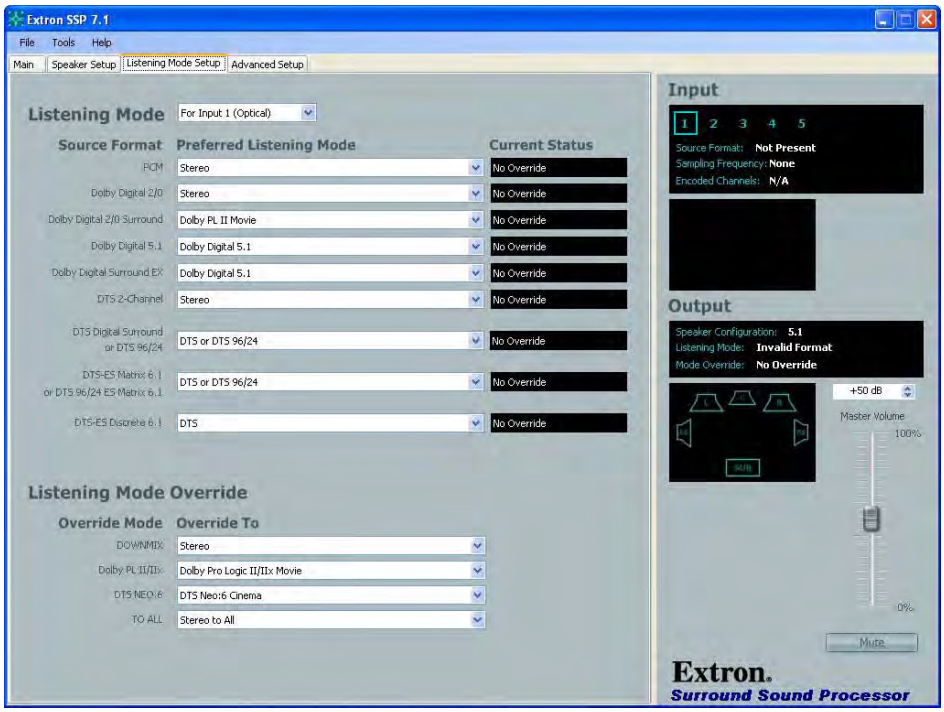
The Reset button returns the Output Trim values for all speakers to the default value (0 dB).

Input/Output information bar

The Input/Output Status bar is available from all GUI tabs and is described in detail on page 5-5.

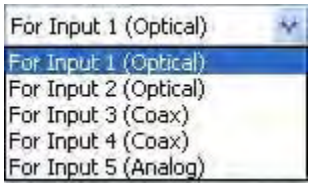
Listening Mode Setup Tab

For each combination of source format and speaker configuration, the SSP 7.1 has a default listening mode. However, this cannot take into account the characteristics of the room or the listener's personal preferences. The Listening Mode Setup tab allows the user to override the unit's default value and set a user value for each input channel and for each combination of source format and speaker combination.



Input channel

Select the input channel to be configured from the drop down menu.



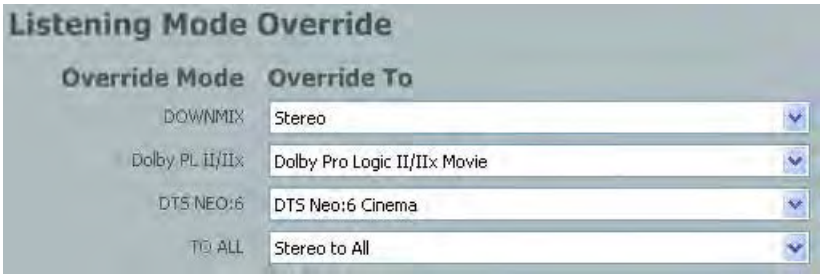
Listening mode selection

Select the preferred listening mode to be associated with each source format. A full list of all options can be found in "Source Formats and Listening Modes with Different Speaker Setups" on page B-15.

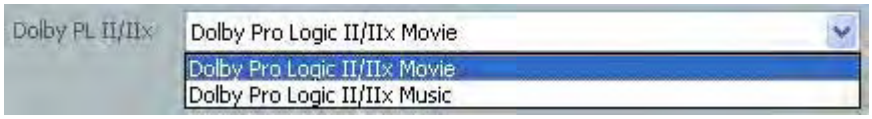
The available selections are dynamically populated so that they represent only the values that are available for the current configuration. When input 5 is selected, the only Source Format available is Analog. When a digital input is selected, a full range of digital source formats is available.

Listening mode override

Below the Source Format/Listening Mode, the mode override options are listed with a dropdown menu showing the available options for each mode override group.



Mode	Listening Mode Options
Downmix	Stereo (default) Mono
PL II/IIx	Dolby Pro Logic II/IIx Movie (default) Dolby Pro Logic II/IIx Music
DTS NEO:6	DTS Neo:6 Cinema (default) DTS Neo:6 Music
TO ALL	Stereo to All (default) Mono to All



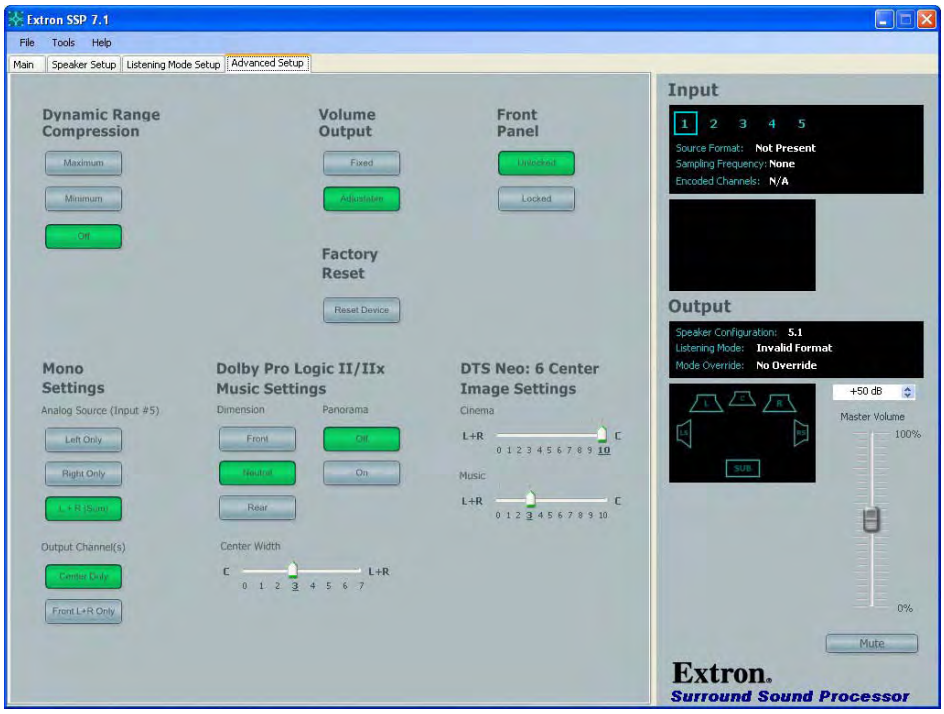
For more information about source formats, see page B-2, listening modes, see pages 4-6 and B-6, mode override, see page 3-6, and listening modes that are available for each source format, see page B-15.

Input/Output information bar

The Input/Output Status bar is available from all GUI tabs and is described in detail on page 5-5.

Advanced Tab

After the **Listening Mode** tab, configure the **Advanced** tab.



The advanced tab allows a user to set Volume, Front Panel Lockout, Reset to Factory defaults, Dynamic Range Compression, Mono Mode Settings, Dolby Pro Logic II/IIx Music settings, and DTS Neo:6 settings.

Volume Output Control

The volume of the audio output through all channels can be set, globally, using these buttons to choose either Fixed or Adjustable (the default value).

Fixed volume

The **Fixed** option sets the volume to full output with no attenuation. The volume cannot be adjusted through the front panel knob or by using the SSP 7.1 Setup and Control Software or SIS commands. All the Output Channel Trim Levels (see page 4-6 and 5-14) are fixed at the values they had immediately before the Volume Output was set to Fixed.

Adjustable

The **Adjustable** option allows the volume to be attenuated through the front panel knob, the SSP 7.1 Setup and Control Software, or by SIS commands.

Front Panel Security Lockout

When the **Locked** button is selected, the Front Panel Security Lockout (Executive Mode) is enabled; when the **Unlocked** button is selected, it is disabled. When the feature is enabled, the user cannot adjust volume, set mode override, or change the input selection from the front panel.

Factory Defaults

The **Reset Device** button undoes any user changes and resets all values to the factory defaults.

Dynamic Range Compression

(Only with Dolby Digital and DTS source formats that have a Dynamic Range Compression flag)

These radio buttons allow a choice of **Off**, **Minimum**, and **Maximum**. The default setting is Off. For more information, see page 4-7.

Mono Mode Settings

Two advanced configurations apply only to mono sources or outputs:

Mono Source (applies to Analog Input #5 only)

If two mono signals are input on input 5 (analog), the user can choose whether the left input, right input, or mixed left and right inputs become the source for the mono decoding mode. By default, the L + R (Sum) selection is used.

Mono Output

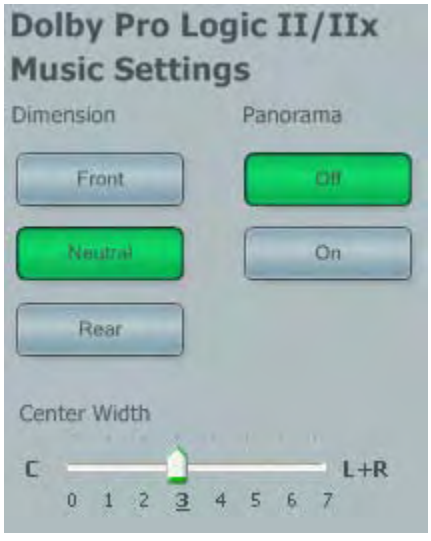
These buttons let the user select whether mono signals are output to the center channel or a dual mono signal is sent to the right and left front channels. By default, the center channel is used.

Dolby Pro Logic II/IIx Music Settings

These controls allow the user to adjust global settings for the Dolby Pro Logic II/IIx Music listening mode. Dolby Pro Logic II Music is used for any stereo music recordings. The music mode provides an additional set of commands to tailor the sound to individual listening tastes. For more information about this listening mode, see page B-8.

Dimension Control

These buttons allow the user to choose **Front**, **Neutral**, or **Rear** (default Neutral). For more information, see page 4-6.



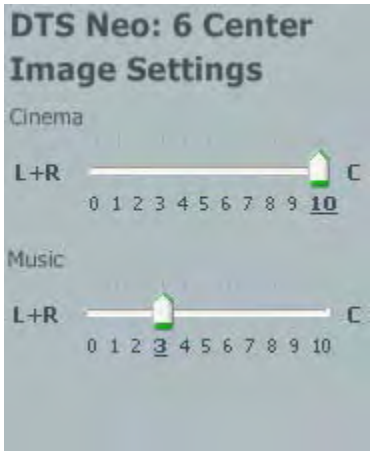
Panorama Control

These buttons allow the user to switch the Panorama settings **On** or **Off** (default Off). For more information about Panorama Control, see page 4-7.

Center Width Control

This sliding bar adjusts the Center Width Control in the range 0 - 7. Setting the control to 0, allows the sound to come from the front center speaker. Setting the control to 7, allows the sound to come from the front right and left speakers. The default setting is 3. For more information, see page 4-6.

DTS Neo:6 Settings



These controls set the center image for DTS Neo:6 Cinema and DTS Neo:6 Music listening modes. For more information about these listening modes, see page B-9.

Center Image Control

The sliding bars adjust the center image control settings for:

- DTS Neo6 Music: 0 - 10 (default 3)
- DTS Neo6 Cinema: 0 - 10 (default 10)

Setting the control to 0, creates the effect of spreading out the audio signal across the front speakers. Setting the control to 10, creates the effect of centralizing the audio signal. For information about the Center Image control, see page 4-7.

Input/Output information bar

The Input/Output Status bar is available from all GUI tabs and is described in detail on page 5-5.

Drop down menus

The menu bar at the top of the window provides additional tools and options. The three top level headings are **File**, **Tools**, and **Help** (see figure at right).

File

The File menu has a single option:

Exit

Clicking on **Exit** shuts down the program.

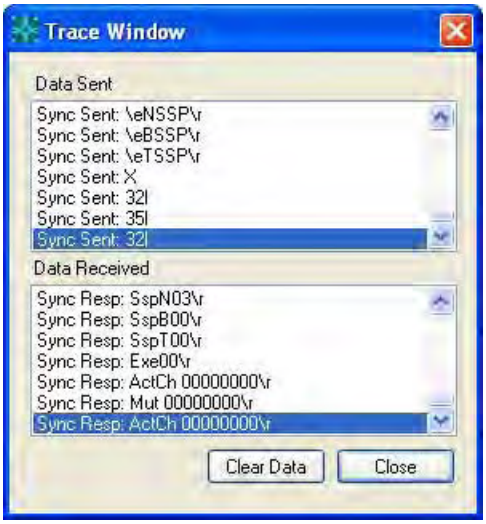
Changes to the configuration of the SSP 7.1 are saved as they are made. Exiting the program will leave all changes from that session in effect.

To restore all values to factory defaults, use the **Reset Device** button in the Factory Defaults section of the Advanced tab.

Tools

The Tools menu has a single option:

Trace Window



The **Trace Window** command opens the Trace Window (see figure at right). The Trace window displays all commands and data sent from the computer to the SSP 7.1 unit in the upper pane, and all responses and data sent from the SSP 7.1 unit to the computer.

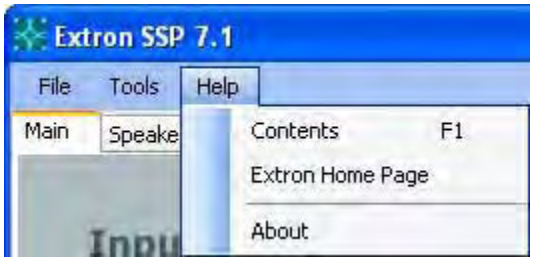
This window is useful to qualified service personnel for some troubleshooting situations.

The **Clear Data** button clears data from both panes.

The **Close** button, shuts down the window. Data is still being sent between the computer and the sound processor and that data is still available for viewing by reopening the window.

Help

The Help menu has three options:



Contents

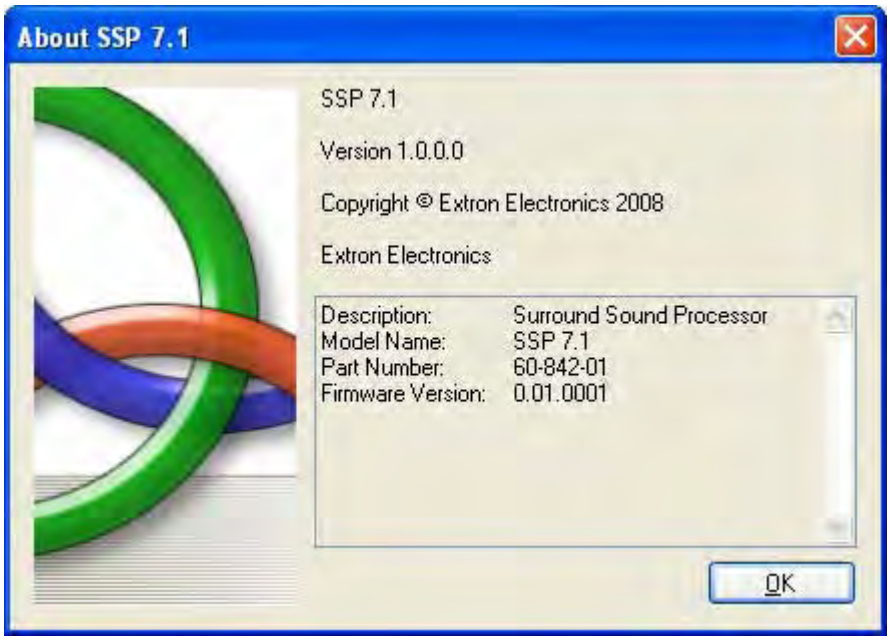
The Contents command accesses the Help file. It is initiated either by clicking on the **Contents** command in the menu or by pressing the F1 key on the keyboard while in the SSP 7.1 Setup and Control Software. (See "SSP 7.1 Setup and Control Software Help File" on page 5-22 for more information.)

Extron Home Page

Clicking the **Extron Home Page** option opens your default web browser at the Extron home page (www.extron.com).

About

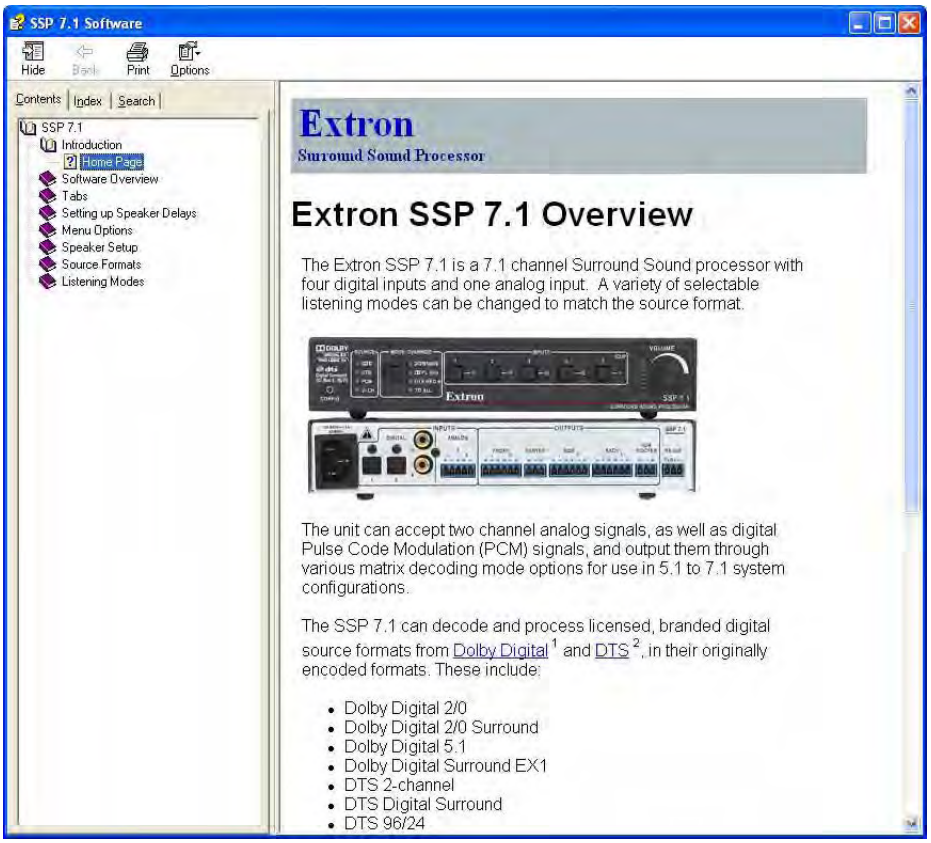
Clicking the About option opens a flash screen with information about the SSP 7.1.



NOTE *Version refers to the currently installed version of the SSP 7.1 Setup and Control software.*

SSP 7.1 Setup and Control Software Help File

Information about the SSP 7.1 Setup and Control Software can also be found in the associated Help File. This can be accessed by clicking **Contents** in the **Help** drop-down menu or by pressing the F1 key when the program is being used.


SSP 7.1 Software
Hide
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Print
Options
Contents
Index
Search
SSP 7.1
Introduction
Home Page
Software Overview
Tabs
Setting up Speaker Delays
Menu Options
Speaker Setup
Source Formats
Listening Modes
Extron
Surround Sound Processor
Extron SSP 7.1 Overview
The Extron SSP 7.1 is a 7.1 channel Surround Sound processor with four digital inputs and one analog input. A variety of selectable listening modes can be changed to match the source format.
The unit can accept two channel analog signals, as well as digital Pulse Code Modulation (PCM) signals, and output them through various matrix decoding mode options for use in 5.1 to 7.1 system configurations.
The SSP 7.1 can decode and process licensed, branded digital source formats from Dolby Digital 1 and DTS 2, in their originally encoded formats. These include:
Dolby Digital 2/0
Dolby Digital 2/0 Surround
Dolby Digital 5.1
Dolby Digital Surround EX1
DTS 2-channel
DTS Digital Surround
DTS 96/24

Use the Table of Contents or the Index in the left panel to find and navigate to a topic.

Firmware Updates

Firmware for the SSP 7.1 can be upgraded using the Extron Firmware Loader utility by following the steps below:

1. Power on the SSP 7.1 and a computer with internet access.
2. Connect the computer to the sound processor through the rear panel RS-232 captive screw connectors.
3. If necessary, install the Extron Firmware Loader utility. This is on the software disk that ships with the unit or can be downloaded, free of charge, from the Extron web site (www.extron.com).
4. From the same site, download the firmware for the SSP 7.1.

   To download the firmware for the sound processor, click on the **Download** tab on the Extron home page and then click the **Firmware** selection in the sidebar to the left:

5. Navigate to the firmware for the SSP 7.1 and click on **Download**.
6. In the dialog box, choose desktop as the destination and click save.
7. Open the Extron Firmware Loader by clicking on the desktop icon.
8. Choose the **RS-232** tab.
9. Select the correct com port and baud rate (default rate is 9600) from the drop-down menus and click **OK**.
10. Click the **Browse** button and navigate to the desktop, where the firmware file was saved (see step **6**).
11. Click **Upload**. The firmware transfer begins and takes approximately 3 minutes.
12. When the "*Transfer Complete!*" message appears, click the **Exit** button and exit the Firmware Loader.

SSP 7.1

Chapter Six

Configuration and Control

Introduction to SIS™

Symbols Used in this Manual

Command/Response Table for SIS Commands

Setting Speaker Delay Settings using SIS Commands

Setting up Test Sources with SIS Commands

Configuration and Control

Introduction to SIS™

The SSP 7.1 accepts SIS commands from a host device such as a computer running the HyperTerminal utility or other control system. The host device can be connected to the 3-pin captive screw connector on the rear panel or to the config port on the front panel. To connect to the config port, use the optional Extron 9-pin D female to 2.5 mm TRS Configuration cable (part # **70-335-01**).

NOTE *The wiring in the RS-232 cables crosses over so that the processor's TX connects with the control device's RX and vice versa.*

NOTE *Neither port takes precedence over the other. Commands are always processed in the order that they are received and, if simultaneous commands were sent to both ports, the scaler processes whichever command the communications buffer passes in first.*

The protocol is 9600 baud, 8 data bit, 1 stop bit, and no parity.

SIS commands consist of a string (one or more characters per command field). Unless otherwise stated, upper and lower case characters may be used interchangeably. Commands do not require any special characters to begin or end the command string. Each response from the SSP 7.1 ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string.

When the SSP 7.1 is first switched on, depending on the model, it sends the message:

© Copyright 2009, Extron Electronics, SSP 7.1, 60-842-01, V 1.xx↵ where 60-842-01 is the catalog part number and V 1.xx is the firmware version number.

Symbols used in this manual

When programming in the field, certain characters are most conveniently represented by their hexadecimal rather than their ASCII values. The table below shows the hexadecimal equivalent of each ASCII character:

ASCII to HEX Conversion Table																				Esc	1B	CR	ØD	LF	ØA
Space	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27										
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F										
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37										
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F										
@	4Ø	A	41	B	42	C	43	D	44	E	45	F	46	G	47										
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F										
P	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57										
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F										
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67										
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F										
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77										
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F										

NOTE *Apart from G (gain) and g (attenuation), upper and lower case characters can be used interchangeably in SIS commands for this product.*

↵ — carriage return with line feed

← — carriage return (no line feed)

• — space character

Esc — Escape key

The Xn values defined in this section are the variables used in the fields of the command response table (see page 6-8).

X1 — Audio Inputs (1-5)
0 = Disconnect all inputs
1 and 2 = Digital audio, optical input
3 and 4 = Digital audio, coaxial input
5 = Analog input

X2 — Audio Outputs (1-8)
1 = Left Front
2 = Center
3 = Right Front
4 = Left Surround Side
5 = Right Surround Side
6 = Left Surround Back
7 = Right Surround Back
8 = Subwoofer

X3 — Status
0 = Off
1 = On

X4 — Volume Output Mode
0 = Fixed (volume no attenuation)
1 = Variable (default)

X5 — Bass and treble adjustment range in dB -10 to +10 dB in 1 dB increments (default 0 dB)

X6 — Volume Adjustment (0 - 100, default = 50 dB; corresponding to attenuation of -100 to 0 dB in 1 dB steps).
Max volume (no attenuation) = 0 dB; Min volume (full attenuation) = -100 dB

X7 — Furthest speaker distance (in units of 0.01 seconds; default = 0)

NOTE *Furthest speaker distance is included for reference only; it is used only with the SSP 7.1 Setup and Control Software (see chapter 5).*

X9 — Input gain and attenuation readout (0 to +24 dB in 1 dB steps; default 0 dB)

X10 — Mono source
1 = Left
2 = Right
3 = Left + Right (default)

X12 — Listening Mode (Matrix Decode Mode indicator on the front panel)
1 = Stereo
2 = Mono
3 = Stereo to All
4 = Mono to All
5 = Dolby Pro Logic
6 = Dolby Pro Logic II/IIx Movie
7 = Dolby Pro Logic II/IIx Music
8 = Dolby Digital 5.1
9 = Dolby Digital EX
10 = Dolby Digital Pro Logic IIx Movie
11 = Dolby Digital Pro Logic IIx Music
12 = DTS or DTS 96/24
13 = DTS ES Matrix or DTS 96/24 ES Matrix
14 = DTS ES Discrete
15 = DTS + Dolby EX or DTS 96/24 + Dolby EX
16 = DTS + Dolby Pro Logic IIx Movie or DTS 96/24 + Dolby Pro Logic IIx Movie
17 = DTS + Dolby Pro Logic IIx Music or DTS 96/24 + Dolby Pro Logic IIx Music
18 = DTS Neo:6 Cinema
19 = DTS Neo:6 Music

X13 — Status
0 = Not present/malfunction
1 = present/OK

X14 — Internal temperature in °C

X15 — Speaker delay (default = 0 on all channels)

X16 — Speaker group size
0 = None (invalid for front speakers)
1 = Small
2 = Large
(defaults: Front = 2; Center = 1; Surround Side = 1)

X17 — Crossover Frequency 1 to 20 (default = step 11/100 Hz)
1 to 9 = 40 to 80 Hz in 5 Hz increments
9 to 16 = 80 to 150 Hz in 10 Hz increments
16 to 20 = 150 to 250 Hz in 25 Hz increments

X19 — Dolby Pro Logic IIx Music Center Width Control
(Range 0-7; default = 3)

X20 — DTS Neo:6 Music/Cinema Center Image (Range 0-10; default = 3 for DTS Neo:6 Music and 10 for DTS Neo:6 Cinema)

X21 — Version (x.xx)

X22 — version and build number (x.xx.xxxx)

X24 — Source Format (Source LED on front panel)
0 = Not Present
1 = Analog (2-CH)
2 = PCM (PCM and 2-CH)
3 = Dolby Digital 5.1 (DD D)
4 = Dolby Digital 2/0 (when 2/0 encoding flag is detected) (DD D and 2-CH)
5 = Dolby Digital 2/0 Surround (when 2/0 matrix encoding is detected) (DD D and 2-CH)
6 = Dolby Digital Surround EX (when EX encoding flag is detected) (DD D)
7 = DTS Digital Surround or DTS 96/24 (DTS)
8 = DTS-ES Matrix 6.1 or DTS 96/24 ES Matrix 6.1 (When ES Matrix encoding flag is detected) (DTS)
9 = DTS-ES Discrete 6.1 (When ES Discrete encoding flag is detected) (DTS)
10 = DTS 2-Channel (DTS and 2-CH)

X25 — Source Format Sampling Frequency
0 = None
1 = 32 kHz
2 = 44.1 kHz
3 = 48 kHz
4 = 88.2 kHz
5 = 96 kHz

X26 — Source Format Encoded Channels

0 = None	9 = 3/0
1 = 1/0	10 = 3/0.1
2 = 1/0 .1	11 = 3/1
3 = 2/0	12 = 3/1.1
4 = 2/0.1	13 = 3/2
5 = 2/1	14 = 3/2.1
6 = 2/1.1	15 = 3/3
7 = 2/2	16 = 3/3.1
8 = 2/2.1	

X27 — Dolby Pro Logic II/IIx Music Dimension Control
0 = Neutral (default)
1 = Front
2 = Back

X31 — Speaker Groups
1 = Left and Right Front
2 = Center
3 = Left and Right Surround Side

X32 — Surround Back Speaker Size Front
0 = None (default)
1 = 1 small speaker
2 = 2 small speakers
3 = 1 large speaker
4 = 2 large speakers

X33 — Output Channel Trim adjustment range in dB (-24 to +12 dB in 1 dB steps; default 0 dB)

X34 — Noise Test Source
0 = None (default)
1 = Dolby
2 = Pink noise

X35 — Dolby Pro Logic II/IIx Music Panorama
0 = Off (default)
1 = On

X36 — Mono Output
1 = Center only (default)
2 = Front Left and Right only

X37 — Dynamic Range Compression
0 = None (default)
1 = MIN
2 = MAX

X38 — Mode Override Group
0 = No Mode Override (no LEDs on)
1 = Multichannel Downmix (DOWNMIX)
2 = Dolby Pro Logic II/IIx (DD PL II/IIx)
3 = DTS Neo:6 (DTS NEO:6)
4 = To All (TO ALL)

X39 — Mute Status
Eight digit representation with each position in the sequence representing a speaker. The speakers are listed in the same order as in X2.
0 = unmuted
1 = muted
For example, Mut 00100001 means the right front speaker and subwoofer are muted and all other speakers are unmuted.

X40 — Active Channel Status
Eight digit representation with each position in the sequence representing a speaker. The speakers are listed in the same order as in X2.
0 = no audio signal present on channel
1 = channel receiving audio signal
2 = channel receiving audio signal, but muted
For example, ActCh 11122001 means the first (left front), second (center), third (right front), and eighth (subwoofer) channels are receiving an audio signal; the fourth (left surround side) and fifth (right surround side) are receiving a signal but it is muted; the sixth (left surround back) and seventh (right surround back) are not receiving a signal.

X41 — Mode Override Group Listening Mode Options
1 = Stereo (DOWNMIX)
2 = Mono (DOWNMIX)
3 = Dolby Pro Logic II/IIx Movie (DD PL II/IIx)
4 = Dolby Pro Logic II/IIx Music (DD PL II/IIx)
5 = DTS Neo:6 Cinema (DTS NEO:6)
6 = DTS Neo:6 Music (DTS NEO:6)
7 = Stereo to All (TO ALL)
8 = Mono to All (TO ALL)

X42 — Baud rate (bps)
0 = 9600 (default)
1 = 19200

2 = 38400
3 = 115200

X43 — DTS Neo:6 Center Image Control Mode
1 = Music
2 = Cinema

Error messages

E01 — Invalid input channel number (too large)

E10 — Invalid command

E13 — Invalid value (too large)

E14 — Not valid for this configuration

Response

NOTE *No Override (X38 = 0) in the Esc U command cannot be viewed or configured: attempting to do so produces an E14 error message*

Expected Unsolicited Responses

Audio Input	Aud X1↵
Audio Input Source Change	SrcFormatX24•SamplingX25•EnChanX26↵
Volume Level	VolX6↵
Input Listening Mode	SspLX1*X24*X12↵
Mode Override Selection	SspQX1*X24*X38↵
Analog Level Input Adjustment	SspAX9↵
Front Panel Lockout	ExeX3↵
Clip	Sts3*X3↵
DTS 96/24 if DTS Source Format	DTS9624•X3↵

NOTE *If the SSP 7.1 does not support or recognize the entered commands, nothing will happen and no response will be issued.*

Command/response table for SIS commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Serial Data Port Parameter Settings			
Configure Serial Port Parameter	Esc X42 CP←	Ccp X42↵	X42 — Surround Back Speaker Size Front 0 = 9600 (default) 1 = 19200 2 = 38400 3 = 115200
View Serial Port Parameter	Esc CP←	Ccp X42↵	
Input Selection			
Select audio input	X1 $	Aud X1↵	X1 — Audio Inputs (1-5) 0 = Disconnect all inputs 1 and 2 = Digital audio, optical input 3 and 4 = Digital audio, coaxial input 5 = Analog input
View audio input	$	Aud X1↵	
Select audio input	X1 !	All X1↵	
View audio input	!	All X1↵	
Audio Mute			
Mute All Output Channels	1Z	AmtX3↵	Sets mute to On for all channels X3 — Status 0 = Off (default) 1 = On
Unmute All Output Channels	0Z	Amt X3↵	Sets mute to Off for all channels
View Mute All Status	Z	Amt X3↵	Reports Mute All status
Mute Specific Channel	X2 *1Z	Amt X2 * X3↵	Set Mute to On for the selected output: X2 — Audio Outputs (1-8) 1 = Left front 2 = Center 3 = Right front 4 = Left surround side 5 = Right surround side 6 = Left surround back 7 = Right surround back 8 = Subwoofer
Unmute Specific Channel	X2 *0Z	Amt X2 * X3↵	Set Mute to Off for the selected output
View Mute Specific Channel	X2 *Z	Amt X2 * X3↵	Shows the Mute Status of the selected output

NOTE *Audio Mute All and Unmute All are global settings. They take precedence over specifically muted channels. If specific channels had been muted prior to enabling Mute All, they will lose their previous channel mute status — they will be unmuted, along with all other channels, if the Unmute All command is issued.*

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Speaker Configuration Information Request			
View Channel Outputs Activity	32I	ActCh X40↵	Shows activity of each channel.
View Mute Channel	35I	Mut X39↵	Mute Status
Set Speaker Size Settings			
Set Speaker Size	Esc S X31 * X16 SSP←	SspS X31 * X16↵	Sets number of speakers in each group X31 — Speaker Groups 1 = Left and Right Front 2 = Center 3 = Left and Right Surround Sound X16 — Speaker group size 0 = None (invalid for front speakers) 1 = Small 2 = Large
View Specific Speaker Size	Esc S X31 SSP←	SspS X31 * X16↵	
Surround Back Speaker Settings			
Set Surround Back Speakers to none	Esc H0SSP←	SspH X32↵	X32 — Surround Back Speaker Size Front 0 = None (default) 1 = 1 small speaker 2 = 2 small speakers 3 = 1 large speaker 4 = 2 large speakers
Set Surround Back Speaker to one small speaker	Esc H1SSP←	SspH X32↵	
Set Surround Back Speakers to two small speakers	Esc H2SSP←	SspH X32↵	
Set Surround Back Speaker to one large speaker	Esc H3SSP←	SspH X32↵	
Set Surround Back Speakers to two large speakers	Esc H4SSP←	SspH X32↵	
View Surround Back Speakers	Esc HSSP←	SspH X32↵	
Subwoofer Output			
Set Subwoofer Off	Esc J0SSP←	SspJ X3↵	Sets Set Subwoofer to Off X3 — Status 0 = Off 1 = On (default)
Set Subwoofer On	Esc J1SSP←	SspJ X3↵	Set Subwoofer to On
View Subwoofer Control	Esc JSSP←	SspJ X3↵	View Subwoofer Status

X40 is an eight digit representation with each position in the sequence representing a speaker. The speakers are listed in the same order as in X2.
0 = no audio signal present on channel
1 = channel receiving audio signal
2 = channel receiving audio signal, but muted
For example, ActCh 11122001 means the first (left front), second (center), third (right front), and eighth (subwoofer) channels are receiving an audio signal; the fourth (left surround side) and fifth (right surround side) are receiving a signal but it is muted; the sixth (left surround back) and seventh (right surround back) are not receiving a signal.

X39 is an eight digit representation with each position in the sequence representing a speaker. The speakers are listed in the same order as in X2.
0 = unmuted
1 = muted
For example, Mut 00100001 means the right front speaker and subwoofer are muted and all other speakers are unmuted.

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Output Channel Trim Settings			
Set a specific Output Channel Trim	Esc V X2 * X33 SSP←	SspV X2 * X33↵	Set gain for the selected output: X2 — Audio Outputs (1-8) 1 = Left front 2 = Center 3 = Right front 4 = Left surround side 5 = Right surround side 6 = Left surround back 7 = Right surround back 8 = Subwoofer X33 — Output gain and attenuation readout in dB (-24 to +12; default = 0)
View a specific Output Channel Trim	Esc V X2 SSP←	SspV X2 * X33↵	View the current gain setting for the selected output
Speaker Delay Settings			
Set a specific speaker's delay	Esc D X2 * X15 SSP←	SspD X2 * X15↵	Set speaker delay for the selected output: X15 — Speaker delay (in 0.1 ms units; default = 0 on all channels):
View a specific speaker's delay	Esc D X2 SSP←	SspD X2 * X15↵	View the current speaker delay for the selected output
Farthest Speaker Distance			
Set farthest speaker's distance	Esc K X7 SSP←	SspK X7↵	
View farthest speaker's distance	Esc KSSP←	SspK X7↵	
NOTE *This command is included for reference: it is for use with the SSP 7.1 Setup and Control Software only*			
Crossover Frequency Setting			
Specify Crossover Frequency	Esc F X17 SSP←	SspF X17↵	Set Crossover Frequency X17 — Crossover Frequency 1 - 20 (default = 11; equivalent to 100 Hz) 1-9 = 40-80 Hz in 5 Hz increments 9-16 = 80-150 Hz in 10 Hz increments 16-20 = 150-250 Hz in 25 Hz increments
View Crossover Frequency	Esc FSSP←	SspF X17↵	View Low Frequency Filter Status
Volume Adjustment			
Specify Volume	X6 V	Vol X6↵	X6 — Volume Adjustment 0 (-100 dB) to 100 (0 dB) in 1 dB steps, default = 50. Max volume (no attenuation) = 100; Min volume (full attenuation) = 0
Increment Volume	+V	Vol X6↵	Increments volume
Decrement Volume	-V	Vol X6↵	Decrements volume
View Volume setting	V	Vol X6↵	View the current volume setting
Bass Adjustment			
Specify Bass Level	Esc B X5 SSP←	SspB X5↵	Sets the Bass level X5 = -10 to +10 dB in 1 dB increments (default = 0)
View Bass Level setting	Esc BSSP←	SspB X5↵	View the current Bass level setting

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Treble Adjustment			
Specify Treble Level	Esc T X5 SSP←	SspT X5↵	Sets the Treble level X5 = -10 to +10 dB in 1 dB increments (default = 0)
View Treble Level setting	Esc TSSP←	SspTX5↵	View the current Treble level setting
Volume Output Mode			
Set Audio Output Mode to Variable	Esc O1SSP←	SspO X4↵	Sets audio output mode to variable X4 — Audio output mode 0 = Fixed 1 = Variable (default)
Set Audio Output Mode to Fixed	Esc O0SSP←	SspO X4↵	
View current volume output mode status	Esc OSSP←	SspO X4↵	View the current audio output mode setting
Front Panel Lockout (Executive Mode)			
Enable	1X	Exe X3↵	Enables Front Panel Lockout (Executive Mode) X3 — Status: 0 = Off (default); 1 = On
Disable	0X	Exe X3↵	Disables Front Panel Lockout
View current Lockout Status	X	Exe X3↵	Displays current Front Panel Lockout status
Dolby Pro Logic II/IIx Music Dimension Control			
Set Dimension Neutral	Esc Z0SSP←	SspZ X27 ↵	Sets Dimension Control to Neutral X27 — Dolby Pro Logic II/IIx Music Dimension Control: 0 = Neutral (default) 1 = Front 2 = Back
Set Dimension Front	Esc Z1SSP←	SspZ X27↵	Sets Dimension Control to Front
Set Dimension Back	Esc Z2SSP←	SspZ X27↵	Sets Dimension Control to Back
View Dimension Control Status	Esc ZSSP←	SspZ X27↵	View the current Dimension Control Status
Dolby Pro Logic II/IIx Music Panorama Mode			
Set Panorama Off	Esc P0SSP←	SspP X3↵	Sets Panorama Status Off X3 — Status 0 = Off (default) 1 = On
Set Panorama On	Esc P1SSP←	SspP X3↵	Sets Panorama Status On
View current Panorama setting	Esc PSSP←	SspP X3↵	Displays the current Panorama status
Dolby Pro Logic II/IIx Music Center Width			
Set Center Width	Esc C X19 SSP←	SspC X19↵	Sets the Center Width X19 — Dolby Pro Logic IIx Music Center Width Control; (Range 0-7; default = 3)
View Center Width	Esc CSSP←	SspC X19↵	Displays the current Center Width status

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
DTS Neo:6 Center Image			
Set Center Image for Music Mode	Esc I1* X20 SSP←	Ssp IX43 * X20↵	Sets the Center Image for Music Mode X20 — DTS Neo:6 Center Image Control (Range 0-10; default = 3 Music Mode; 10 Cinema Mode) X43 — DTS Neo:6 Center Image Control Mode (1 = Music; 2 = Cinema)
Set Center Image for Cinema Mode	Esc I2* X20 SSP←	Ssp IX43 * X20↵	Sets the Center Image for Cinema Mode
View Center Image	Esc I X43 SSP←	SspI X43 * X20↵	Displays the current Center Image status
Dynamic Range Compression			
Set Dynamic Range Compression to None	Esc R0SSP←	SspR X37↵	Sets the Dynamic Range Compression X37— Dynamic Range Compression 0 = None (default) 1 = Min 2 = Max
Set Dynamic Range Compression to Min	Esc R1SSP←	SspR X37↵	
Set Dynamic Range Compression to Max	Esc R2SSP←	SspR X37↵	
View Dynamic Range Control	Esc RSSP←	SspR X37↵	Displays the current Dynamic Range status
Mono Output Mode			
Set Mono Output to Center Channel Only	Esc M1SSP←	SspM X36↵	Sets the Mono Output Channel X36 — Mono Output 1 = Center only 2 = Left + Right
Set Mono Output to Front L/R Channels Only	Esc M2SSP←	SspM X36↵	
View current Mono Source setting	Esc MSSP←	SspM X36↵	Displays the current Mono Output channel
Listening Mode			
Set specific User Listening Mode	Esc LX1*X24*X12SSP←	SspL X1 * X24 * X12↵	Sets the listening mode
View current Listening Mode status	Esc LSSP←	SspL X24 * X12↵	Displays the current listening mode status
View User Listening mode per Input/Source Format	Esc X X1 * X24 SSP←	SspX X1 * X24 * X12↵	Shows the current listening mode associated with a source format and input

X1 — Input (1-5): 1 and 2 = Digital audio, optical input; 3 and 4 = Digital audio, coaxial input; 5 = Analog input

X12 — Listening Mode (Matrix Decode Mode indicator on the front panel): 1 = Stereo; 2 = Mono; 3 = Stereo to All; 4 = Mono to All; 5 = Dolby Pro Logic; 6 = Dolby Pro Logic II/IIx Movie; 7 = Dolby Pro Logic II/IIx Music; 8 = Dolby Digital 5.1; 9 = Dolby Digital EX; 10 = Dolby Digital Pro Logic IIx Movie; 11 = Dolby Digital Pro Logic IIx Music; 12 = DTS or DTS 96/24; 13 = DTS ES Matrix or DTS 96/24 ES Matrix; 14 = DTS ES Discrete; 15 = DTS + Dolby EX or DTS 96/24 + Dolby EX; 16 = DTS + Dolby Pro Logic IIx Movie or DTS 96/24 + Dolby Pro Logic IIx Movie; 17 = DTS + Dolby Pro Logic IIx Music or DTS 96/24 + Dolby Pro Logic IIx Music; 18 = DTS Neo:6 Cinema; 19 = DTS Neo:6 Music

X24 — Source Format: 0 = Not Present ; 1 = Analog (2-CH); 2 = PCM (PCM and 2-CH); 3 = Dolby Digital 5.1 (DD D); 4 = Dolby Digital 2/0 (when 2/0 encoding flag detected) (DD D and 2-CH); 5 = Dolby Digital 2/0 Surround (when 2/0 matrix encoding detected) (DD D and 2-CH); 6 = Dolby Digital Surround EX (when EX encoding flag detected) (DD D); 7 = DTS Digital Surround or DTS 96/24 (DTS); 8 = DTS-ES Matrix 6.1 or DTS 96/24 ES Matrix 6.1 (when ES Matrix encoding flag detected) (DTS); 9 = DTS-ES Discrete 6.1 (when ES Discrete encoding flag detected) (DTS); 10 = DTS 2-Channel (DTS and 2-CH)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Mode Override Selection			
Set Mode Override	Esc Q X1 * X24 * X38 SSP ←	SspQ X1 * X24 * X38 ↵	Sets the Mode Override
View Mode Override for each input	Esc Q X1 * X24 SSP ←	SspQ X1 * X24 * X38 ↵	Displays the current Mono Output status
Listening Mode Preference for each Mode Override Group			
Set Listening Mode Preference for each Mode Override Group	Esc U X1 * X38 * X41 SSP ←	SspU X1 * X38 * X41 ↵	Sets the Listening Mode Preference for each Mode Override Group
View Listening Mode Preference for each Mode Override Group	Esc U X1 * X38 SSP ←	SspU X1 * X38 * X41 ↵	Displays the current Listening Mode Preference for each Mode Override Group
Mono Source Setting (for Analog input #5 only)			
Set Mono Source to Left Channel	Esc N1SSP ←	SspN X10 ↵	Sets Mono Source X10 — Mono source 1 = Left (default) 2 = Right 3 = Left + Right
Set Mono Source to Right Channel	Esc N2SSP ←	SspN X10 ↵	
Set Mono Source to Left + Right Channel	Esc N3SSP ←	SspN X10 ↵	
View current Mono Source	Esc NSSP ←	SspN X10 ↵	Displays the current Mono Source Setting
Analog Input Gain Adjustment (for Analog Input #5 only)			
Set Analog Input Gain Level	Esc A X9 SSP ←	SspA X9 ↵	Sets the Analog Input Gain Level X9 — Input gain 0 to +24 dB in 1 dB steps (default = 0)
View Analog Input Gain Level	Esc ASSP ←	SspA X9 ↵	Displays the current Analog Input Gain
Speaker Configuration Information Request			
View channel Outputs Activity	32I	ActCh X40 ↵	
Source Format Information Request			
View channel Outputs Activity	33I	SrcFormat X24 • Sampling X25 • EnChan X26 ↵	Displays the Source Format (X24), Source Format sampling frequency (X25), and Source Format Encoded Channels (X26)

X25 — Source Format Sampling Frequency: 0 = None; 1 = 32 kHz; 2 = 44.1 kHz; 3 = 48 kHz; 4 = 88.2 kHz; 5 = 96 kHz

X26 — Source Format Encoded Channels: 0 = None; 1 = 1/0; 2 = 1/0.1; 3 = 2/0; 4 = 2/0.1; 5 = 2/1; 6 = 2/1.1; 7 = 2/2; 8 = 2/2.1; 9 = 3/0; 10 = 3/0.1; 11 = 3/1; 12 = 3/1.1; 13 = 3/2; 14 = 3/2.1; 15 = 3/3; 16 = 3/3.1

X38 — Mode Override Group: 0 = No Mode Override (no LEDs on); 1 = Multichannel Downmix (DOWNMIX); 2 = Dolby Pro Logic II/IIx (DD PL II/IIx); 3 = DTS Neo:6 (DTS NEO:6); 4 = To All (TO ALL)

X40 is an eight digit representation with each position in the sequence representing a speaker. The speakers are listed in the same order as in X2. 0 = no audio signal present on channel; 1 = channel receiving audio signal; 2 = channel receiving audio signal, but muted

For example, ActCh 11122001 means the first (left front), second (center), third (right front), and eighth (subwoofer) channels are receiving an audio signal; the fourth (left surround side) and fifth (right surround side) are receiving a signal but it is muted; the sixth (left surround back) and seventh (right surround back) are not receiving a signal.

X41 — Mode Override Group Listening Mode Options: 1 = Stereo (DOWNMIX); 2 = Mono (DOWNMIX); 3 = Dolby Pro Logic II/IIx Movie (DD PL II/IIx); 4 = Dolby Pro Logic II/IIx Music (DD PL II/IIx); 5 = DTS Neo:6 Cinema (DTS NEO:6); 6 = DTS Neo:6 Music (DTS NEO:6); 7 = Stereo to All (TO ALL); 8 = Mono to All (TO ALL)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Source Format Flag Detection			
View if DTS 96/24 encoded in DTS source	34I	DTS9624•X3↵	Status of DTS 96/24 encoded in DTS source X3 — Status: 0 = Off (default); 1 = On
Test Signal Noise			
Turn Test Signal Off	EscX0TSTA←	TstaXX34↵	X34 — Sets the Test Signal Noise Source: 0 = Off (default); 1 = Dolby; 2 = Pink
Turn Dolby Noise Test Signal On	EscX1TSTA←	TstaXX34↵	
Turn Pink Noise Test Signal On	EscX2TSTA←	TstaXX34↵	
View Test Signal Status	EscXTSTA←	TstaXX34↵	Displays current Test Signal Noise Source
Information Request			
Query firmware version	Q	VerX21↵	X21 — Version (x.xx)
Query firmware version and build number	*Q	VerX22↵	X22 — version and build number (x.xx.xxxx)
Request part number	N	Pno60-842-01	SSP 7.1 part number: 60-842-01
Request general information	I or 0I	AudX1•LModX12 •VolX6•MutX3↵	Displays the audio input number (X1), Listening Mode (X12), Volume (X6), and Mute Status (X3)
Request model name	1I	SSP 7.1↵	Model name is SSP 7.1
System Reset			
Master Reset	EsczXXX←	Zpx↵	Resets all parameters to factory defaults
Factory Reset	EsczQQQ←	Zpq↵	Same as Master Reset but also resets baud rate.
Firmware Upload			
Upload firmware	EscUPLOAD←	Go↵ Upl↵	Upload begins Upload successful
Status Commands			
View internal temperature (°C)	20S	Sts20*X14↵	X14 — Internal temperature in °C
View Clip Status	3S	Sts3*X3↵	Displays Clip Status: X3 — Status: 0 = Off (default); 1 = On

X1 — Input (1-5): 1 and 2 = Digital audio, optical input; 3 and 4 = Digital audio, coaxial input; 5 = Analog input

X6 — Volume Adjustment (0 - 100, default = 50 dB; corresponding to attenuation of -100 to 0 dB in 1 dB steps).
Max volume (no attenuation) = 0 dB; Min volume (full attenuation) = -100 dB

X12 — Listening Mode (Matrix Decode Mode indicator on the front panel): 1 = Stereo; 2 = Mono; 3 = Stereo to All; 4 = Mono to All;
5 = Dolby Pro Logic; 6 = Dolby Pro Logic II/IIx Movie; 7 = Dolby Pro Logic II/IIx Music; 8 = Dolby Digital 5.1; 9 = Dolby Digital EX;
10 = Dolby Digital Pro Logic IIx Movie; 11 = Dolby Digital Pro Logic IIx Music; 12 = DTS or DTS 96/24;
13 = DTS ES Matrix or DTS 96/24 ES Matrix; 14 = DTS ES Discrete; 15 = DTS + Dolby EX or DTS 96/24 + Dolby EX;
16 = DTS + Dolby Pro Logic IIx Movie or DTS 96/24 + Dolby Pro Logic IIx Movie;
17 = DTS + Dolby Pro Logic IIx Music or DTS 96/24 + Dolby Pro Logic IIx Music; 18 = DTS Neo:6 Cinema; 19 = DTS Neo:6 Music

Setting Speaker Delay settings using SIS commands

NOTE *It is strongly recommended that, for ease and simplicity, these adjustments are made with the SSP 7.1 Setup and Control Software (see page 5.9). If that is not possible, the delay values can be calculated and entered, using SIS commands.*

To adjust Compensation Delays using SIS commands, follow these instructions:

Two person setup

NOTE *Setting up speaker delays is easier with two people. If only one person is available, the position of the listener's ears must be marked precisely using, for example, a pile of boxes. Do not try to guess ear positions, as this will introduce measurement errors.*

1. Pick an ideal central location where all speaker output signals converge.
2. Use a tape measure to measure the distance from each speaker to the convergence location. Be sure to measure to the same spot from each speaker.

NOTE *Measurements from the speaker should be to the midrange driver in a three-way speaker or from halfway between the tweeter and the woofer in a two-way speaker. Measurements to the convergence location should be at ear height.*

3. When the distances to every speaker have been measured accurately, select the speaker that is farthest from the convergence location and use that distance as a reference value.
4. Calculate the delay distance for each speaker, where:

   Delay Distance = Farthest Speaker Distance - Individual Speaker Distance
5. Calculate the delay time (in ms) for each speaker, where:

   Delay Time = Delay Distance / Vs

NOTE *The constant Vs, the speed of sound, is 0.343 m/ms or 1.12533 ft/ms.*

6. For SIS commands, the delay time must be converted to units of 0.1 ms:

   SIS Delay time = Delay Time (per ms) x 10
7. Compile the information into a table (if possible, use a spreadsheet program to carry out the calculations automatically). An example is given below:

Speaker Channel	Measured Distance (ft)	Delay (ft)	Delay Time (ms)	SIS Delay Time
Left	12.00 (farthest speaker)	0.00	0.0	0
Right	11.00	1.00	0.9	9
Center	10.50	1.50	1.3	13
Left Side	8.25	3.75	3.3	33
Right Side	7.50	4.50	4.0	40
Left Back	6.13	5.87	5.2	52
Right Back	7.50	4.50	4.0	40

8. Use these SIS Delay Time values when entering SIS commands to compensate for speaker delay where there are no Lip Sync effects (see Speaker Delay Settings on page 6-9).

Setup with a Real Time Analyzer (RTA) calibration tool

1. Pick an ideal central location on which all speaker output signals converge.
2. Place the microphone from the RTA at ear level in the convergence location.
3. Play the audio source. This can be an analog source, provided by the RTA, or a digital source, provided by a test CD.
4. Use SIS commands (see chapter 6) to change the listening mode for the input signal to "Mono for All". If necessary, configure the mono source to Left, Right, or, if using an analog input, Left + Right.
5. Use SIS commands to mute or unmute specific output channels.
6. Use the RTA to measure the outputs of each channel.
7. Calculate the speaker with the longest delay (normally recorded in ms)
8. Calculate the Delay Time (in ms) and the SIS Delay Time for each speaker and compile the values in a table as described in the "Two person setup" section on the previous page.

NOTE *The RTA provides Delay Times in ms, so there will be no columns for Measured Distance (ft) or Delay (ft).*

9. Use these SIS Delay time values when entering SIS commands, to compensate for speaker delay where there are no Lip Sync effects (see Speaker Delay Settings on page 6-9).

Compensating for Lip Sync Offset

Processing video signals often introduces delays to the video signal, relative to the audio signal. Lip Sync Offset is used to delay the audio signals to every output channel to resynchronize the audio and video signals.

NOTE *When compensating for both speaker delays and Lip Sync offset, calculate the individual speaker delay times first and then add a constant Lip Sync offset to each speaker.*

The following table uses the same individual speaker delay values from the table on page 6-15 but also introduces a 10 ms delay to compensate for Lip Sync effects.

Speaker Channel	Delay Time (ms)	Lip Sync offset (ms)	Total Delay Time (ms)	SIS Delay Time
Left	0.0	10.0	10.0	100
Right	0.9		10.9	109
Center	1.3		11.3	113
Left Side	3.3		13.3	133
Right Side	4.0		14.0	140
Left Back	5.2		15.2	152
Right Back	4.0		14.0	140

These SIS Delay Time values (in units of 0.1 ms) must be used with SIS commands, when compensating for speaker delays and/or Lip Sync offset.

Setting up Test Sources with SIS Commands

Extron recommends that the SSP 7.1 Setup and Control Software is used to calibrate the system with the test signals, as described on page 5-12. If this is not possible, it is possible to calibrate the system using SIS commands.

Using Pink Noise or Dolby Noise test signals

1. Send the SIS command that turns on the test source as Pink Noise (Esc X2TSTA ←) or Dolby Noise (Esc X1TSTA ←).
2. Send the SIS command that mutes all output channels (1Z).
3. Send the SIS command to unmute each output channel individually (X2*0Z where X2 represents the number of the output channel).
4. The signal will be output through the unmuted channel; the user can adjust speaker delay or output trim and hear the test noise change in real time.
5. Mute the current output and unmute the next channel, to test each output in turn.
6. To end the session send the SIS command that turns off the test source (Esc X0TSTA ←) and the SIS command that unmutes all channels (0Z).

Using External Source test signals

1. Select the input that will supply the test signal.
2. Change the listening mode for the input signal's source format to "Mono to All", using SIS commands (see chapter 6) in one of the following ways:
   a. Configure User's Mode settings to auto select "Mono to All" as the input signal's format. If the listening mode was changed, the source is downmixed to mono, which is output to all available channels at equal levels.

   OR

   b. With a source actively playing, toggle through the mode override options to select "To All". Enter the SIS command Esc U X1*4*8SSP ← to change the option to "Mono to All".

      X1 is the input channel, 4 is for the "To All" Mode Override Group, and 8 selects "Mono to All".
3. Play the source audio through the selected input.
4. If the user mode was correctly set to "Mono to All" in step 2, the output should be heard equally from all channels. If not, toggle the Mode Override button on the front panel to "To All", to enable "Mono to All".
5. Send the SIS command that mutes all output channels (1Z).
6. Send the SIS command to unmute each output channel individually (X2*0Z where X2 represents the number of the output channel).
7. The signal is output through the unmuted channel; the user can adjust speaker delay or output trim and hear the test noise change in real time.
8. Mute the current output and unmute the next channel, to test each output in turn.
9. To end the session send the SIS command that turns off the test source (Esc X0TSTA ←) and the SIS command that unmutes all channels (0Z).

Appendix A

Specifications, Parts and Accessories

Specifications

Included Parts

Optional Accessories

Specifications, Parts, and Accessories

Specifications

Audio

Gain (0 dB Volume)	Unbalanced output: -6dB, Balanced output: 0dB
Frequency response	20 Hz to 20 kHz, ±0.2 dB
THD + Noise	<0.03% @ 1 kHz, at maximum output level
S/N	>100 dB, 20 Hz to 20 kHz, unweighted
Stereo channel separation	Analog input only: >90 dB @ 1 kHz
CMRR	Analog input only: >75 dB (typical) @ 1 kHz
Bass adjustment	±10 dB @ 90 Hz
Treble adjustment	±10 dB @ 7500 Hz
Volume control	- 100 dB to 0 dB
Bass management crossover frequencies	40 Hz to 250 Hz

Audio input — analog

Number/signal type	1 analog stereo/mono, balanced/unbalanced
Listening modes	Stereo, stereo to all, mono, mono to all, Dolby® Pro Logic®, Dolby Pro Logic II Movie/Music, Dolby Pro Logic IIx Movie/Music, DTS™ Neo:6 Cinema/Music
Connector	(1) 3.5 mm captive screw connector, 5 pole
Impedance	>10k ohms balanced/unbalanced, DC coupled
Nominal level	+4 dBu (1.23 Vrms) balanced or -10 dBV (316 mVrms) unbalanced
Maximum level	+15 dBu (balanced/unbalanced) at 1% THD+N
Input gain adjustment	0 dB to +24 dB (default = 0 dB), adjustable via RS-232

NOTE *0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu*

Audio input — digital

Number/signal type	(2) S/PDIF optical (T0sLink), (2) S/PDIF coaxial
Source formats	PCM, Dolby Digital 2/0, Dolby Digital 2/0 Surround, Dolby Digital 5.1, Dolby Digital Surround EX, DTS 2-channel, DTS Digital Surround, DTS-ES Matrix 6.1, DTS-ES Discrete 6.1, DTS 96/24, DTS 96/24 ES Matrix 6.1
PCM sampling rates	32, 44.1, 48, 88.2, 96 kHz
Listening modes	Stereo, stereo to all, mono, mono to all, Dolby Digital, Dolby Digital EX, Dolby Pro Logic, Dolby Pro Logic II Movie/Music, Dolby Pro Logic IIx Movie/Music, DTS, DTS 96/24, DTS-ES Matrix, DTS 96/24 ES Matrix, DTS-ES Discrete, DTS Neo:6 Cinema/Music, DTS + Dolby EX, DTS 96/24 + Dolby EX, DTS + Dolby Pro Logic IIx Movie/Music, DTS 96/24 + Dolby Pro Logic IIx Movie/Music
Connectors	2 TOSLINK™ fiber optic connectors 2 RCA Jack connectors

Audio output

Number/signal type	8 stereo, balanced/unbalanced, for left and right front, left and right sides, left and right back, center, and subwoofer output
Connectors	(8) 3.5 mm captive screw connectors, 3 pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	±0.2 dB channel to channel
Maximum level (Hi-Z)	>+21 dBu balanced or >+15 dBu unbalanced at 0.03% THD+N
Output level range per channel	-24 dB to + 12 dB
D/A conversion	24 bit, 96 kHz

Control/remote — audio processor

Serial host control port	1 bidirectional RS-232 front panel 2.5 mm mini stereo jack 1 bidirectional RS-232 rear panel 3.5 mm captive screw connector, 3 pole
Baud rate and protocol	9600 (default), 19200, 38400, 115200 baud (adjustable); 8 data bits, 1 stop bit, no parity
Pin configuration	Mini stereo jack: tip = TX, ring = RX, sleeve = GND Captive screw connector: pin 1 = TX, 2 = RX, 3 = GND
Program control	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™)

General

Power	100 VAC to 240 VAC, 50-60 Hz, 12 watts, internal
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling	Convection, no vents
Mounting	
Rack mount	Yes, with optional 1U rack shelf
Furniture mount	Yes, with optional under-desk mounting kit
Enclosure type	Metal
Enclosure dimensions	1.7" H x 8.75" W x 6.0" D (1U high, half rack wide) (4.3 cm H x 22.2 cm W x 15.2 cm D) (Depth excludes connectors and knob.)
Product weight	1.3 lbs (0.6 kg)
Shipping weight	3 lbs (2 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance	
Safety	CE, c-UL, UL
EMI/EMC	CE, C-tick, FCC Class B, ICES, VCCI
Environmental	Complies with the appropriate requirements of RoHS, WEEE
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *All nominal levels are at ±10%*

NOTE *Specifications are subject to change without notice.*

Included Parts

Included parts	Replacement part number
(1) SSP 7.1	60-842-12
(4) Rubber feet (not attached)	
(1) 5-pole, 3.5 mm captive screw plug	
(9) 3-pole, 3.5 mm captive screw plug	
SSP 7.1 Windows® Control Program	
Tweeker	
(1) IEC power cable	
SSP 7.1 Setup Guide	

Optional Accessories

Accessory	Part number
RSU 126 (6" deep, 1U rack shelf kit)	60-190-10
RSB 126 (6" deep, 1U basic rack shelf)	60-604-10
RSU 129 (9.5" deep, 1U rack shelf kit)	60-190-01
RSB 129 (9.5" deep, 1U basic rack shelf)	60-604-01
MBU 125 Under-desk mounting kit	70-077-01
CSR 6 (5-pin captive screw to RCA female audio adapter)	26-575-01

SSP 7.1

Appendix B

Reference Material

Source Formats

Sampling Frequency

Listening Mode Options and Usage

Reference Material

Source Formats

Surround Channel Information

Surround channel information is written in the following format:

A/B.C (For example 3/2.1)

A represents the number of front channels (maximum 3: Front Right, Front Left, and Center). If A is 1, the source format has a mono encoded signal for playback through the center channel. If A is 2, the source format encodes two discrete channels for stereo playback through the front right and front left channels. If A is 3, there is a discrete encoded signal for all three front speakers.

B represents the number of side channels (maximum 3: Surround Right, Surround Left, and Surround Back). If B is 1, the source format has a mono encoded signal for playback as dual mono through the surround right and surround left channels. If B is 2, the source format encodes two discrete channels for stereo playback through the surround right and surround left channels. If B is 3, there is a discrete encoded signal for all three speakers, including the back speaker.

NOTE *There is no "4" option because, while the SSP 7.1 can output up to eight full bandwidth channels, there are presently no source formats that can pass digital bit stream audio information containing 7.1 discrete encoded channels through S/PDIF connections, which only the SSP 7.1 supports.*

C represents the presence or absence of LFE (1 = present; 0 = none or absent). This is the discrete bass information, normally designated for use with the subwoofer channel, but may be mixed with other channels in the absence of a subwoofer.

Encoded Channels	Minimum Required Output Speaker Configuration
1/0.0 or 2/0.0	2.0
1/0.1 or 2/0.1	2.1
2/1.0	5.0
2/1.1	5.1
2/2.0	5.0
2/2.1	5.1
2/3.0	6.0
2/3.1	6.1
3/0.0	3.0
3/0.1	3.1
3/1.0	5.0
3/1.1	5.1
3/2.0	5.0
3/2.1	5.1
3/3.0	6.0
3/3.1	6.1

NOTE *The minimum allowable configuration of the SSP 7.1 is 2.0 because the left and right front speakers are always on. In the absence of a center channel, 1/0.0 and 1/0.1 encoded channels are output equally to both front channels.*

NOTE *7.0, 7.0 (with no center channel), 7.1, and 7.1 (with no center channel) are valid output speaker configurations. However, standard DVD audio sources cannot be encoded as 2/4.0, 2/4.1, 3/4.0, or 3/4.1.*

NOTE *Blu-Ray DVD players are designed to output audio from Blu-Ray DVDs, which can carry 7.1 or more discrete encoded channels. However, that audio can only be transmitted via the HDMI output and can only be processed by an AV receiver that supports HDMI connections. The Blu-Ray player should support S/PDIF connection that will output Dolby Digital and DTS multi-channel source formats, which are also embedded in the Blu-Ray DVD and can be used to feed into the SSP 7.1 via TosLink or coaxial connection.*

Dolby Digital Source Formats (DD D)

Inputs 1- 4 only.

Dolby Digital 5.1

(3/2.1, 3/2, 3/1.1, 3/1, 3/0, 3/0.1, 2/2.1, 2/2, 2/1.1, 2/1, 2/0.1, 2/0, 1/0.1, or 1/0)

Dolby Digital is a flexible, discrete, digital technology for carrying audio. Dolby Digital is a 5.1-channel surround sound format and is the standard for DVD video.

Dolby Digital features up to five discrete, channels (front center, front left, front right, surround left, and surround right), which gives it the "5" designation. Each of the channels is full frequency with respect to human hearing (20 Hz to 20k Hz). There is an additional channel reserved for low frequency effects (LFE), which is usually reserved for the subwoofer speaker(s) or other speakers capable of reproducing low frequency ranges (3 - 120 Hz). This gives the ".1" designation, since the sixth channel is not full frequency.

Although referred to as 5.1, it includes a variety of combinations, including 1.0, 2.0, 2.1, 3.0, 3.1, 4.0, 4.1, 5.0, and 5.1.

Dolby Digital 2/0

(2/0)

Dolby Digital 2/0 is a specific stereo format encoded by Dolby Digital technology. Encoded information is intended, primarily, for playback by the front left and front right speakers. TV broadcasts or DVD movie commentaries often have audio tracks encoded using this format.

When the SSP 7.1 detects this source format, both the DD D and 2-CH LEDs are lit.

Dolby Digital 2/0 Surround

(2/0)

Dolby Digital 2/0 Surround is the consumer version of the original Dolby multichannel analog film sound format. Left, center, right, and mono surround are matrix-encoded onto two audio tracks. These two tracks can be decoded by Dolby Pro Logic to recreate the original four-channel sound. This source format is used, typically, for digital television broadcast signals and older, remastered, movies.

When the SSP 7.1 detects this source format, both the DD D and 2-CH LEDs are lit.

Dolby Digital Surround EX

(3/2.1)

Dolby Digital Surround EX is a commercial format that reproduces the center channel information through speakers placed directly behind the listener.

The back surround information is matrix-encoded onto the right and left surround channels of conventional Dolby 5.1 formats. If there is no back channel speaker, the information for that channel is played through the right and left surround speakers.

DTS Source Formats (DTS)

Inputs 1- 4 only.

DTS 2-Channel

(2/0)

DTS 2-Channel is a specific DTS encoded stereo format. Material encoded in this source format is typically found in DTS-HD Blue Ray DVDs and is primarily intended for playback by the left and right front speakers. When this source format is present, both the DTS and the 2-CH LEDs will light.

DTS Digital Surround

(3/2.1, 3/2, 3/1.1, 3/1, 3/0, 3/0.1, 2/2.1, 2/2, 2/1.1, 2/1, 2/0.1, 2/0, 1/0.1, or 1/0)

DTS Digital Surround is a 5.1-channel surround sound format similar to Dolby Digital 5.1. As with the Dolby format, there are five full frequency channels (front center, front left, front right, surround left, and surround right) and an additional LFE channel.

DTS 96/24

(*3/2.1, 3/2, 3/1.1, 3/1, 3/0, 3/0.1, 2/2.1, 2/2, 2/1.1, 2/1, 2/0.1, 2/0, 1/0.1 or 1/0*)

DTS 96/24, provides high quality audio reproduction of music and movies from DVDs encoded with DTS Digital Surround source format information. The 96 kHz sampling frequency is an improvement over the more typical 48 kHz. All DTS formats have 24 bit depth, which allows more audio information to be stored compared with the normal 16 bit depth.

DTS-ES Matrix 6.1

(3/2.1)

DTS-ES Matrix 6.1 is a 5.1 channel format with the back surround channel matrix-encoded into the right and left surround channels. This is achieved in much the same way as the front center channel is matrix-encoded into the front left and right channels of the Dolby Pro Logic format. Since the back surround channel is not discrete, this is not a true 6.1 source format.

DTS 96/24 ES Matrix 6.1

(3/2.1)

This mode is similar to DTS-ES Matrix 6.1 but also has DTS 96/24 encoded.

DTS-ES Discrete 6.1

(3/3.1)

DTS-ES Discrete 6.1 has a back surround channel that is discretely encoded into the DTS bitstream. This format gives better sound spatialization for complete sound localization and sound pans (the movement of a sound source through the sound field). This format provides a data flag to signal the decoder that the bitstream contains an extra channel.

Listening modes that extend DTS Digital Surround or DTS-ES Matrix 6.1, such as DTS + Pro Logic IIx Music or DTS + Pro Logic IIx Movie, will also output 96 kHz/24 bit signals for the rear channels.

Material encoded in the DTS-ES Discrete 6.1 format cannot carry DTS 96/24 information because of bandwidth limitations as a result of the discretely encoded surround back channel information.

When the SSP 7.1 detects DTS source material with the DTS 96/24 feature, the sampling frequency of the signal is displayed by the SSP 7.1 Setup and Control Software. The SSP 7.1 Setup and Control Software also changes the text associated with the Listening Modes to reflect that DTS 96/24 is being output.

PCM Digital Source Format (PCM)

Inputs 1-4 only.

Two channel, uncompressed, digital signals are processed through any of the four digital inputs. The sampling frequency of the digital signal is displayed by the SSP 7.1 Setup and Control Software.

When the SSP 7.1 detects this source format, both the PCM and 2 CH LEDs are lit.

2-Channel Source Format (2CH)

Analog

Input 5 only.

Any balanced or unbalanced stereo signal (or two balanced or unbalanced mono sources) are accepted. This includes older VCR tape recordings that were labeled as having Dolby 2/0 Pro Logic audio.

Digital

Inputs 1-4 only.

When the SSP 7.1 detects any two channel digital signal, including PCM, Dolby Digital 2/0, Dolby Digital 2/0 Surround, or DTS-2 Channel, the 2 CH LED is lit.

Sampling Frequency

The following table shows the most common sampling frequencies of digital inputs and the uses with which they are most often associated:

Sampling Frequency (kHz)	Use
32	Used for some cassette recordings, speech, and all other audio where smaller files are desired, with only slight compromise on sound quality. In the past, used with products such as Nicams.
44.1	Audio CD, also commonly used with MPEG-1 audio (VCD, SVCD, MP3). Adopted from the PCM adaptor using PAL video tapes (294 lines by 3 samples by 50 frames per second).
48	Digital sound used for mini DV, digital TV, DVD, DAT, films and professional audio.
88.2	Sampling rates used by professional recording equipment when the destination is CD (multiples of 44.1k Hz).
96	DVD-Audio, some LPCM DVD tracks, DTS 96/24, and DTS 96/24 ES Matrix 6.1 source formats will always output this sampling frequency.

Listening Mode Options and Usage

Listening Mode Options

Stereo

This mode plays a stereo source in its pure, unprocessed form. It is the default factory setting for any analog signal and any PCM or Dolby Digital 2/0 source coming through the digital inputs.

It can be used to downmix a multi-channel source format into a mixed stereo output signal.

Mono

This mode plays mono source material or stereo that has been mixed to a mono form. It can be used to downmix a multi-channel source format into a single mixed mono output signal.

The audio can be output to the center channel only, front left or front right only. If there is no center channel, the signal is output to left and right front channels as a dual mono signal.

Two advanced configurations apply only to mono sources:

Mono Source (applies to Analog Input #5 only) — If two mono signals are input on input 5 (analog), the user can choose whether the left input, right input, or mixed left and right inputs become the source for the mono decoding mode. By default, the L + R (Sum) option is used.

Mono Output — This adjustment lets the user select whether mono signals are output to the center channel or a dual mono signal is sent to the right and left front channels. By default, the center channel is used.

Stereo to All

This mode plays stereo or downmixed stereo sources to all stereo channel output pairs in the system.

If the source is a single analog mono signal and the listening mode is set to "Stereo to All", the following conditions apply:

- If the mono source is set to left channel only, the audio will be output only to available left channels in the system
- If the mono source is set to right channel only, the audio will output only to available right channels in the system
- If the mono source is set to Left + Right channels, the audio will be distributed evenly as a dual mono signal to all available stereo pairs.

Mono to All

This mode plays mono or downmixed mono sources to all channel outputs in the system. The mono source (left input, right input, or mixed left and right inputs) can be selected using the SSP 7.1 Setup and Control Software or SIS commands.

Dolby Digital 5.1

This mode is used with Dolby Digital-encoded source formats. It produces up to 5.1 discrete channels (center, left and right front, and left and right surround with a low frequency effects channel).

DTS

This mode is used with DTS Digital Surround-encoded source formats. It also produces up to 5.1 discrete channels (center, left and right front, and left and right surround with a low frequency effects channel).

This is the default mode for DTS-ES Matrix 6.1 source formats when the system is set up for 3.0 to 5.1. It can be used with this source format to play the audio without the matrix-encoded back channel information.

DTS 96/24

This mode is used with DTS Digital Surround source formats that have been encoded using DTS 96/24. It also produces up to 5.1 output channels, with audio sampled at 96 kHz at 24 bit depth.

This is also the default listening mode for DTS 96/24 ES Matrix 6.1 source formats for systems with a 3.0 to 5.1 speaker configuration or if the listener wants to play the audio without the matrix-encoded back channel information.

DTS-ES Matrix

This mode decodes DTS-ES Matrix 6.1 source formats, for use in a 6.0 to 7.1 system. Upon playback, the additional surround back channel signal is decoded from the surround left and right channels.

The listening mode can also be used with DTS Digital Surround sources where a surround back channel is created through matrix processing.

DTS 96/24 ES Matrix

This mode is similar to DTS 96/24 but is used with DTS-ES Matrix 6.1 source formats. It can also be used to extend DTS 96/24 source formats from 5.1 to 6.1 by creating a surround back channel by matrix processing.

DTS-ES Discrete

This mode decodes DTS-ES Discrete 6.1 source formats and reproduces all 6.1 channels, including the center channel information that was recorded independently, using the Digital Discrete system.

Dolby Digital EX

This listening mode is designed to decode source material that was recorded using Dolby Digital Surround EX technology. It uses matrix mixing to produce extended surround back channel effects, which create 6.1 outputs from 5.1 source formats. When used with 6.1 source formats, the original back channel information will be replaced by a matrix mixed sixth channel.

NOTE *This mode is only available when the SSP 7.1 is set up for 6.1 or 7.1 outputs and a multi-channel source format (except DTS-ES Discrete 6.1, DTS-ES Matrix 6.1, or DTS 96/24 ES Matrix 6.1) is available.*

Dolby Pro Logic

This mode decodes source audio that is encoded in two-channel Dolby Surround to provide four-channel playback (center, left, right and mono side surrounds). Sources include videocasettes, DVDs, and TV broadcasts.

Logic steering techniques extend the impact of the sound track over a wider listening area. This listening mode creates a mono side surround channel with a high-frequency roll off above 7 kHz.

Dolby Pro Logic II/IIx Movie or Music

Dolby Pro Logic II builds on Dolby Pro Logic by breaking the mono side surround channel into a pair of stereo side surround channels for playback in a 5.1 surround sound setup. This is achieved by a matrix surround decoder.

Dolby Pro Logic II only works with 2-channel source formats that are used in a 5.1 configuration. It is available as Dolby Pro Logic II Movie and Dolby Pro Logic II Music.

Dolby Pro Logic II Movie is used for VCRs, TV broadcasts, and all programs encoded in Dolby Surround. Dolby Pro Logic II Music is used for any stereo music recordings.

Dolby Pro Logic IIx Movie and Music extend the Dolby Pro Logic II matrix decoding technology to derive up to seven channels from a two channel source, which provides additional outputs for surround back channel effects.

Both the Movie and Music modes produce up to seven full bandwidth matrixed channels. Music mode has hard back effects (shared across all surround speakers) instead of just the back speakers, which the Movie mode has.

Dolby Pro Logic II/IIx Music mode provides an additional set of commands to tailor the sound to individual listening tastes:

Dimension Control

This alters the ratio of L+R to L-R for two-channel input signals. This has the effect of adjusting the sound field towards the front or towards the back, making the sound more or less spacious.

Center Width Control

Pro Logic decoding produces a single center signal that comes from the center speaker. If there is no center speaker, a "phantom" center image is produced that is split between the right and left speakers. Center Width Control allows variable adjustment of the center image so it is heard only from the center speaker, only from the right and left speakers, or from all three speakers in varying degrees.

Panorama Control

This extends the Center Width Control, so that all or part of the center image can be heard from the side surround speakers for a "wraparound" effect.

Dolby Digital Pro Logic IIx Movie or Music

This mode builds on the Dolby Pro Logic IIx matrix mixing technology, to create up to two additional surround back channels from the original Dolby Digital 5.1 channel information. In Dolby Pro Logic IIx Movie mode, two additional channels (right and left back) are produced. In Dolby Pro Logic IIx Music mode, a single additional center back channel is produced. The Dolby Digital Pro Logic IIx Music mode uses the same Dimension, Center Width, and Panorama controls that are available for Dolby Pro Logic IIx Music mode (see the section above).

NOTE *This listening mode is only available when the SSP 7.1 is set up for 6.0 to 7.1 channel outputs and a multichannel Dolby Digital source format is present.*

NOTE *Dolby Pro Logic IIx Movie and Dolby Digital EX are electronically equivalent when the system is set up for 6.1.*

DTS + Dolby Pro Logic IIx Movie or Music

This mode uses Dolby Pro Logic IIx matrix mixing effects to create up to two additional surround back channel effects from the original 5.1 information of a DTS Digital Surround or DTS-ES Matrix 6.1 source format. Both the Movie and Music modes produce up to seven full bandwidth matrixed channels.

NOTE *This listening mode is only available when the SSP 7.1 is set up for 6.0 to 7.1 channel outputs and a DTS Digital Surround source format is present.*

DTS 96/24 + Dolby Pro Logic IIx Movie or Music

This mode is similar to DTS + Dolby Pro Logic IIx Movie or Music (see above), but is intended for use with DTS 96/24 source formats.

DTS + Dolby EX

This mode uses Dolby Digital EX matrix mixing surround effects to create an additional surround center back channel from the discrete 5.1 information of a DTS Digital Surround source format to create up to 6.1 channel effects.

NOTE *This listening mode is only available when the SSP 7.1 is set up for 6.1 to 7.1 channel outputs and a DTS Digital Surround source format is present.*

DTS 96/24 + Dolby EX

This mode is similar to DTS + Dolby EX (see above), but is intended for use with DTS 96/24 source formats.

DTS Neo:6 Cinema or Music

This mode produces up to seven separate full-bandwidth matrix channels from a 2-channel (stereo) audio input.

DTS Neo:6 Cinema assigns the in-phase component of the signal to the center channels and the reversed phase component to the surround (left, right and center or left/right back) channels.

In the DTS Neo:6 Music mode, the left and right front channels bypass the decoder and are played directly, with no loss of sound quality. The surround signal outputs from the center, right side, left side (for 5.1), the center (for 6.1), or left and right back (for 7.1) channels. In the DTS Neo:6 Music mode, there is one adjustable control:

Center Image Control

The Center Image control varies the amount of attenuation applied to the Left and Right channel information of the input source that is used for creating the output Center channel effects. When it is set to 0, the mixed input signal information, intended for use in creating the Center output channel of the DTS Neo:6 listening modes, is filtered back to the Front Left and Right output channels. This creates the effect of spreading the centralized audio signal across all three front output channels. When this control is set to 10, the matrixed information intended for the front left and front right output channel effects is fully attenuated, allowing the Center channel to dominate and creating a more centralized effect from the front channels.

Listening Modes Usage

Listening mode	Number of signal channels	Types of channels	Media used
Mono	1	• 1 discrete or 1 downmix matrixed, full-bandwidth channel (C)	• Analog signal • CDs or DVDs downmixed to 1 channel
Stereo	2	• 2 discrete or 2 downmix matrixed, full-bandwidth channel (L/R)	• Stereo music • All DVDs downmixed to 2 channels
Mono to all	Up to 7.1	• 1 discrete or 1 downmix matrixed, full-bandwidth channel (C) • 2 to 6 matrixed, full-bandwidth channels (L/R, LS/RS, and CB or LB/RB)	• Analog signal • CDs or DVDs downmixed to 1 channel
Stereo to all	Up to 6.1	• 2 discrete or 2 downmix matrixed, full-bandwidth channels (L/R) • 2 or 4 matrixed, full-bandwidth channels (LS/RS and/or LB/RB)	• Stereo music • All DVDs downmixed to 2 channels
Dolby Pro Logic	4	• 2 discrete, full-bandwidth channels (L/R) • 1 matrixed, full-bandwidth channel (C) • 1 matrixed, limited-bandwidth channel (S)	• Stereo and Dolby Surround encoded VHS movies and broadcast TV programs
Dolby Pro Logic II Music or Movie	5.1	• 2 discrete, full-bandwidth channels (L/R) • 3 matrixed, full-bandwidth channels (C, LS/RS) • 1 subwoofer channel via Dolby Pro Logic II bass management	• Stereo and Dolby Surround-encoded VHS movies and broadcast TV programs • Stereo music • Video games
Dolby Digital 5.1	5.1	• 5 discrete, full-bandwidth channels (L/R, C, LS/RS) • 1 discrete LFE channel (LFE)	• All DVDs • Some broadcast HDTV • Some DBS
DTS or DTS 96/24	5.1	• 5 discrete, full-bandwidth channels (L/R, C, LS/RS) • 1 discrete LFE channel (LFE)	• Some DVDs, which are encoded with DTS • Some CDs, which are encoded with DTS

Listening mode	Number of signal channels	Types of channels	Media used
DTS Neo:6 Music or Cinema	Up to 7.1	• 2 discrete, full-bandwidth channels (L/R) • 3 to 5 matrixed, full-bandwidth channels (C, LS/RS, and **CB, if 6.1**, or **LB/RB, if 7.1**) • 1 subwoofer channel via DTS Neo:6 bass management	• Stereo VHS movies and broadcast TV programs • Stereo music • Video games
Dolby Pro Logic IIx Music	6.0 to 7.1	• 2 discrete, full-bandwidth channels (L/R) • 4 to 5 matrixed, full-bandwidth channels (C, LS/RS, and CB or LB/RB) • 1 subwoofer channel via Dolby Pro Logic IIx bass management	• Stereo and Dolby 2/0 Pro-Logic encoded VHS movies and broadcast TV programs • Stereo music • Video games
Dolby Pro Logic IIx Movie	6.0 to 7.1	• 2 discrete, full-bandwidth channels (L/R) • 4 to 5 matrixed, full-bandwidth channels (C, LS/RS, and CB or LB/RB) • 1 subwoofer channel via Dolby Pro Logic IIx bass management	• Stereo and Dolby Surround encoded VHS movies and broadcast TV programs • Stereo music • Video games
Dolby Digital EX *(for use with Dolby Digital 5.1 or Dolby Digital Surround EX)*	6.0 to 6.1	• 5 discrete, full-bandwidth channels (L/R, C, LS/RS) • 1 matrixed, full-bandwidth channel (CB) • 1 discrete LFE channel (LFE)	• Some DVDs, which are encoded with Dolby Digital EX • Dolby Digital 5.1 DVDs can also be used with a Dolby Digital EX decoder
DTS-ES Matrix or DTS 96/24 ES Matrix *(For use with DTS-ES Matrix 6.1 or DTS Digital Surround Source Formats)*	6.0 to 6.1	• 5 discrete, full-bandwidth channels (L/R, C, LS/RS) • 1 matrixed, full-bandwidth channel (CB) • 1 discrete LFE channel (LFE)	• Some DVDs, which are encoded with DTS Digital Surround, DTS 96/24, DTS-ES Matrix 6.1, or DTS 96/24 ES Matrix 6.1
DTS-ES Discrete	6.0 to 6.1	• 6 discrete, full-bandwidth channels (L/R, C, LS/RS, and CB) • 1 discrete LFE channel (LFE)	• Some DVDs, which are encoded with DTS-ES Discrete 6.1

Listening mode	Number of signal channels	Types of channels	Media used
Dolby Digital Pro Logic IIx Music	6.0 to 7.1	• **Dependent on configuration:** 5 discrete, full-bandwidth channels (L/R, C, LS/RS) • 1 or 2 matrixed, full-bandwidth channel (CB or LB/RB) • 1 discrete LFE channel (LFE)	• All DVDs • Some broadcast HDTV • Some DBS
Dolby Digital Pro Logic IIx Movie	6.0 to 7.1	• **Dependent on configuration:** 5 discrete, full-bandwidth channels (L/R, C, LS/RS) • 1 or 2 matrixed, full-bandwidth channels (CB or LB/RB) • 1 discrete LFE channel (LFE)	• All DVDs • Some broadcast HDTV • Some DBS
DTS + Dolby EX or DTS 96/24 + Dolby EX *(for use with DTS Digital Surround Format only)*	6.0 to 6.1	• 5 discrete, full-bandwidth channels (L/R, C, LS/RS) • 1 matrixed, full-bandwidth channel (CB) • 1 discrete LFE channel (LFE)	• Some DVDs, which are encoded with DTS Digital Surround or DTS 96/24 • Uses Dolby Digital matrix processing techniques to produce Center Back channel information
DTS + Dolby Pro Logic IIx Music or DTS 96/24 + Dolby Pro Logic IIx Music *(for use with DTS Digital Surround Format only)*	6.0 to 7.1	• **Dependent on configuration:** 5 discrete, full-bandwidth channels (L/R, C, LS/RS) • 1 or 2 matrixed, full-bandwidth channel (CB or LB/RB) • 1 discrete LFE channel (LFE)	• Some DVDs, which are encoded with DTS Digital Surround or DTS 96/24
DTS + Dolby Pro Logic IIx Movie or DTS 96/24 + Dolby Pro Logic IIx Movie *(for use with DTS Digital Surround Format only)*	6.0 to 7.1	• **Dependent on configuration:** 5 discrete, full-bandwidth channels (L/R, C, LS/RS) • 1 or 2 matrixed, full-bandwidth channels (CB or LB/RB) • 1 discrete LFE channel (LFE)	• Some DVDs, which are encoded with DTS Digital Surround or DTS 96/24

Listening Mode and Output Channels

Listening mode	Output Channels				
	L/R	C	LS/RS	CB or LB/RB	Sub woofer
Mono	-	•	-	-	Yes, if LFE exists in the source format or L/R are set to small[1]
Stereo	•	-	-	-	Yes, if LFE exists in the source format or L/R are set to small
Mono to all	•	•	•	CB or LB/RB	Yes, if LFE exists in the source format or L/R are set to small
Stereo to all	•	-	•	LB/RB	Yes, if LFE exists in the source format or L/R are set to small
Dolby Pro Logic	•	•	S	-	Yes, if L/R are set to small
Dolby Pro Logic II Music or Movie	•	•	•	-	Yes, if L/R are set to small
Dolby Digital 5.1	•	•	•	-	Yes, if LFE exists in the source format or L/R or LS/RS are set to small
DTS or DTS 96/24	•	•	•	-	Yes, if LFE exists in the source format or L/R or LS/RS are set to small
DTS Neo:6 Music or Cinema	•	•	•	CB or LB/RB	Yes, if L/R are set to small
Dolby Pro Logic IIx Music or Movie	•	•	•	CB or LB/RB	Yes, if L/R are set to small
Dolby Digital EX	•	•	•	CB	Yes, if LFE exists in the source format or L/R or LS/RS are set to small
DTS-ES Matrix or DTS 96/24 ES Matrix	•	•	•	CB	Yes, if LFE exists in the source format or L/R or LS/RS are set to small
DTS-ES Discrete	•	•	•	CB	Yes, if LFE exists in the source format or L/R, LS/RS, or CB are set to small
Dolby Digital Pro Logic IIx Music	•	•	•	CB or LB/RB	Yes, if LFE exists in the source format or L/R or LS/RS are set to small

Listening mode	Output Channels				
	L/R	C	LS/RS	CB or LB/RB	Sub woofer
Dolby Digital Pro Logic IIx Movie	•	•	•	CB or LB/RB	Yes, if LFE exists in the source format or L/R or LS/RS are set to small
DTS + Dolby EX or DTS 96/24 + Dolby EX	•	•	•	CB	Yes, if LFE exists in the source format or L/R or LS/RS are set to small
DTS + Dolby Pro Logic IIx Music or DTS 96/24 + Dolby Pro Logic IIx Music	•	•	•	CB or LB/RB	Yes, if LFE exists in the source format or L/R or LS/RS are set to small
DTS + Dolby Pro Logic IIx Movie or DTS 96/24 + Dolby Pro Logic IIx Movie	•	•	•	CB or LB/RB	Yes, if LFE exists in the source format or L/R or LS/RS are set to small

NOTE *• Shows which channels are used in each listening mode*
- shows which channels are unused
S denotes that LS and RS will receive the same signal
[1] speakers can be set to large, small or none (see "Speaker Size" on page 4-4).
CB denotes that surround back channel will either output to LB only in 6.0 or 6.1 setups or to LB and RB equally in 7.0 or 7.1 setups.

Source Formats and Listening Modes with Different Speaker Setups

NOTE *Setups that have no surround sides or back channels, or center channel are classified as 2.0 to 2.1.*
Setups with no surround back channels are classified as 3.0 to 5.1.
Setups with back channels are classified as 6.0 to 7.1, depending on whether one or two surround back channels are present.

Source Format	2.0 or 2.1	3.0 to 5.1	6.0 to 7.1
Analog (input #5 only)	Stereo (default) Mono	Stereo (default) Stereo to All Mono Mono to All Dolby Pro Logic Dolby Pro Logic II Movie Dolby Pro Logic II Music DTS Neo:6 Cinema DTS Neo:6 Music	Stereo (default) Stereo to All Mono Mono to All Dolby Pro Logic Dolby Pro Logic IIx Movie Dolby Pro Logic IIx Music DTS Neo:6 Cinema DTS Neo:6 Music
PCM (inputs #1-4 only)	Stereo (default) Mono	Stereo (default) Stereo to All Mono Mono to All Dolby Pro Logic Dolby Pro Logic II Movie Dolby Pro Logic II Music DTS Neo:6 Cinema DTS Neo:6 Music	Stereo (default) Stereo to All Mono Mono to All Dolby Pro Logic Dolby Pro Logic IIx Movie Dolby Pro Logic IIx Music DTS Neo:6 Cinema DTS Neo:6 Music
Dolby Digital 2/0 (inputs #1-4 only)	Stereo (default) Mono	Stereo (default) Stereo to All Mono Mono to All Dolby Pro Logic Dolby Pro Logic II Movie Dolby Pro Logic II Music DTS Neo:6 Cinema DTS Neo:6 Music	Stereo (default) Stereo to All Mono Mono to All Dolby Pro Logic Dolby Pro Logic IIx Movie Dolby Pro Logic IIx Music DTS Neo:6 Cinema DTS Neo:6 Music
Dolby Digital 2/0 Surround (inputs #1-4 only)	Stereo (default) Mono	Stereo Stereo to All Mono Mono to All Dolby Pro Logic Dolby Pro Logic II Movie (default) Dolby Pro Logic II Music DTS Neo:6 Cinema DTS Neo:6 Music	Stereo Stereo to All Mono Mono to All Dolby Pro Logic Dolby Pro Logic IIx Movie (default) Dolby Pro Logic IIx Music DTS Neo:6 Cinema DTS Neo:6 Music

Source Format	2.0 or 2.1	3.0 to 5.1	6.0 to 7.1
Dolby Digital 5.1 (inputs #1-4 only)	Stereo (default) Mono	Stereo Stereo to All Mono Mono to All Dolby Digital 5.1 (default)	Stereo Stereo to All Mono Mono to All Dolby Digital 5.1 (default) Dolby Digital EX Dolby Digital Pro Logic IIx Movie Dolby Digital Pro Logic IIx Music
Dolby Digital Surround EX (inputs #1-4 only)	Stereo (default) Mono	Stereo Stereo to All Mono Mono to All Dolby Digital 5.1 (default)	Stereo Stereo to All Mono Mono to All Dolby Digital 5.1 Dolby Digital EX (default in 6.1) Dolby Digital Pro Logic IIx Movie (default in 7.1) Dolby Digital Pro Logic IIx Music
DTS 2-Channel (inputs #1-4 only)	Stereo (default) Mono	Stereo (default) Stereo to All Mono Mono to All Dolby Pro Logic Dolby Pro Logic II Movie Dolby Pro Logic II Music DTS Neo:6 Cinema DTS Neo:6 Music	Stereo (default) Stereo to All Mono Mono to All Dolby Pro Logic Dolby Pro Logic IIx Movie Dolby Pro Logic IIx Music DTS Neo:6 Cinema DTS Neo:6 Music
DTS 96/24 (inputs #1-4 only)	Stereo (default) Mono	Stereo Stereo to All Mono Mono to All DTS 96/24 (default)	Stereo Stereo to All Mono Mono to All DTS 96/24 (default) DTS 96/24 ES Matrix DTS 96/24 + Dolby EX DTS 96/24 + Dolby Pro Logic IIx Movie DTS 96/24 + Dolby Pro Logic IIx Music
DTS Digital Surround (inputs #1-4 only)	Stereo (default) Mono	Stereo Stereo to All Mono Mono to All DTS (default)	Stereo Stereo to All Mono Mono to All DTS (default) DTS-ES Matrix DTS + Dolby EX DTS + Dolby Pro Logic IIx Movie DTS + Dolby Pro Logic IIx Music

Source Format	2.0 or 2.1	3.0 to 5.1	6.0 to 7.1
DTS 96/24 ES Matrix 6.1 (inputs #1-4 only)	Stereo (default) Mono	Stereo Stereo to All Mono Mono to All DTS 96/24 (default)	Stereo Stereo to All Mono Mono to All DTS 96/24 DTS 96/24 ES Matrix (default)
DTS-ES Matrix 6.1 (inputs #1-4 only)	Stereo (default) Mono	Stereo Stereo to All Mono Mono to All DTS (default)	Stereo Stereo to All Mono Mono to All DTS DTS-ES Matrix (default)
DTS-ES Discrete 6.1 (inputs #1-4 only)	Stereo (default) Mono	Stereo Stereo to All Mono Mono to All DTS (default)	Stereo Stereo to All Mono Mono to All DTS-ES Discrete (default)

SSP 7.1

Appendix C

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Glossary

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Glossary

Bass Management — Low frequency sounds are usually better handled by the subwoofer speaker. Bass Management organizes the low frequency component of designated input signals, along with the Low Frequency Effects (LFE) information encoded in the source format and passes that information to a subwoofer (if available). *(Also see Crossover Frequency, Low Frequency Effects, and Speaker Size.)*

Center Image Control — (DTS Neo:6 Music or Cinema) This control attenuates the level of the front left and right speakers without affecting the level of the center channel to create a better balance. There are eleven possible settings, from 0 to 10. At setting 0, there is no attenuation of the right and left front channels, so that the center channel spreads out. At setting 10, there is maximum attenuation (6 dB) of the right and left front channels, which allows the center channel to dominate. The default setting for DTS Neo:6 Music is 3; the default setting for DTS Neo:6 Cinema is 10.

Center Width Control — Pro Logic decoding produces a single center signal that comes from the center speaker. If there is no center speaker, a "phantom" center image is produced that is split between the right and left speakers. If right, left, and center speakers are present, center width control allows variable adjustment of the center image so that it is heard only from the center speaker, only from the right and left speakers, or from all three speakers in varying degrees.

Compensation Delay — In a room where speakers are not equidistant from the listener, sound from the closest speaker reaches the listener before sound from the farthest speaker. This adjustment delays the signals going to individual speakers: the signal to the speaker farthest from the listener is not delayed while speakers that are closer to listener, are. This ensures that the sound from each speaker reaches the listener at the same time.

Crossover Frequency — The Crossover Frequency sets the boundary below which the low frequency signals from designated output channels are incorporated into Bass Management. The Bass Management signal is passed to the subwoofer (if present) and speakers that have been set to output the signal. *(Also see Bass Management, Low Frequency Effects, and Speaker Size.)*

Dimension Control — This feature alters the ratio of L+R to L-R for two-channel input signals, which adjusts the sound field towards the front or towards the back. The available settings are front, neutral, or back. The default setting is neutral.

Dolby noise — Dolby noise provides a bandpass-filtered noise, centered at 750 Hz with a 12 dB/octave roll off. This signal is also generated by the SSP 7.1 and is used to set speakers to the same level when calibrating the room.

Downmix — multiple channel signals are mixed to produce a stereo or mono output signal.

Dynamic Range Compression — This control adjusts the gain applied to Dolby Digital or DTS listening modes to compress the signal outputs during the decoding process. The three possible settings are none, minimum, and maximum. The default setting is None.

Executive Mode — *see Front Panel Security Lockout*

External Source (Test Signal) — An external calibration source, is usually used to test specific decoding mode outputs. When the External Source option is chosen, the speakers that receive the test signal can be specified.

Front Panel Security Lockout — When Front Panel Security Lockout is enabled, the user is unable to change the input selection or adjust the volume from the front panel. It does not block changes made using SIS commands or the SSP 7.1 Setup and Control Software.

Listening Mode — The listening mode determines how the signals of the source format are decoded and distributed to the system's speakers. Not all listening modes are available for every input mode and the SSP 7.1 offers factory defined listening modes that are matched to the source format and speaker configuration. The user can override the default listening mode to fully define a listening mode that suits the source format, the speaker configuration, the room in which the system is installed, and the listener's personal preferences.

Low Frequency Effects (LFE) — This information is encoded in the source signal and is intended to be played back by the subwoofer. Bass management mixes this information with the low frequency signals from designated output channels and directs it to the subwoofer (if present) and speakers that have been set to output the signal. *(Also see Bass Management, Crossover Frequency, and Speaker Size.)*

Mode Override — The user can customize the listening mode to the needs of the source format, speaker configuration, and the venue in which the system is installed through the use of the Listening Mode Override. This is a front panel control that can be further refined by the SSP 7.1 Setup and Control Software.

Mute — It is possible to completely silence the output from all channels (universal mute) or each channel individually.

Panorama Control — This feature extends the Center Width Control, so that all or part of the center image can be heard from the side surround speakers for a "wraparound" effect. The feature may be on or off. The default setting is Off.

Pink noise — Pink noise is a random signal with all audio frequencies present, that is generated by the SSP 7.1. It provides equal energy per octave to provide a flat response over all frequencies. The main purpose of pink noise is to calibrate a speaker's interaction with its environment.

Test Signal — Test signals are used during setup to calibrate each channel's levels and to ensure proper connection between the SSP 7.1's individual output channels and the line level input channels of an audio signal processor, a receiver with built in amplifier, or a stand alone amplifier that will power the loudspeakers. There are three options for test source: pink noise, Dolby noise, and an external source.

Simple Instruction Set (SIS) — The SSP 7.1 accepts SIS commands from a host device such as a computer running the HyperTerminal utility or other control system. SIS commands consist of a string (one or more characters per command field). The commands are used to configure the SSP 7.1 unit and, depending on the command, will usually produce a response which can be seen on the screen of the host device.

Source Format — Audio signals are recorded and processed in different formats. The recorded signals contain differing amounts of information, encoded in different ways, and the format determines how accurately the sound that is played back reflects the original sound as it was recorded.

Speaker Size — Speakers can be set to Large, Small, or None. Speakers set to Large play the full range of sound intended for that output channel. Speakers set to small play only the frequencies that are above the crossover frequency. The low frequency portion of the signal from that channel is incorporated into Bass Management and directed to the subwoofer (if present) and speakers that have been set to large. Speakers that are set to None, are effectively removed from the system and do not receive an output signal. *(Also see Bass Management, Crossover Frequency, and Low Frequency Effects.)*

SSP 7.1 — The SSP 7.1 is a 7.1 channel Surround Sound processor with selectable listening modes that can be changed to match the source format. It can accept 2 channel analog signals, as well as digital PCM signals, and output them through various matrix decoding mode options for use in 5.1 to 7.1 system configurations. The SSP 7.1 can decode and process licensed, branded digital source formats from Dolby Digital and DTS, in their originally encoded formats.

SSP 7.1 Setup and Control Software — The SSP 7.1 Setup and Control Software provides an intuitive, easy to operate, graphical user interface that allows the user to configure the sound system quickly and efficiently. It is on the disk that comes with the unit or it can be downloaded, free of charge, from the Extron Web site (www.extron.com).

Tone Controls — These controls regulate the Bass and Treble settings for the system, using the SSP 7.1 Setup and Control Software or SIS commands.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron Electronics
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

Japan: Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe, Africa, and the Middle East:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

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Extron Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

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F12, PO Box 293666
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This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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